

ATTACHMENT C

NE Novelty Hill Road Project (CIP 100992)

Draft Discipline Report Summaries

King County Road Services Division

December 2006

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Abbreviations and Acronyms

196th	196th Avenue NE
208th	208th Avenue NE
ACM	asbestos-containing material
Avondale	Avondale Road NE
BMP	best management practice
CFR	Code of Federal Regulations
CO	carbon monoxide
dB	decibel
dBA	A-weighted decibel
Ecology	Washington State Department of Ecology
EIS	environmental impact statement
EJ	environmental justice
EPA	United States Environmental Protection Agency
ESC	erosion and sediment control
FIRES	finance, insurances, real estate, and services
HOV	high-occupancy vehicle
LBP	lead-based paint
L _{eq}	equivalent sound level
LID	low-impact development
LOS	level of service
LWCFA	Land and Water Conservation Fund Act
MSAT	mobile source air toxics
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHR	NE Novelty Hill Road
NHRP	NE Novelty Hill Road Project
NOAA	National Oceanic and Atmospheric Administration
NO _x	nitrogen oxides
NPS	National Park Service
PCBs	polychlorinated biphenyls
PFO	palustrine forested

PM	particulate matter
PM ₁₀	particulates < 10 micrometers in size
PM _{2.5}	particulates < 2.5 micrometers in size
PSCAA	Puget Sound Clean Air Agency
PSRC	Puget Sound Regional Council
SEPA	State Environmental Policy Act
SIP	State Implementation Plan
SR	State Route
TSP	total suspended particulates
UHR	NE Union Hill Road
UPD	urban planned development
USC	United States Code
USFWS	United States Fish and Wildlife Service
VOC	volatile organic compound
WSDOT	Washington State Department of Transportation

1. Introduction

This document contains the summaries from each of the NE Novelty Hill Road Project Draft Discipline Reports. Some of the reports have been approved by the Washington State Department of Transportation, and some of the reports are still under review.

2. Traffic and Transportation

Introduction

As a result of increasing traffic pressure in the Bear Creek Planning Area of King County, Washington, specific roadway capacity and safety improvements are being considered for construction. This document presents a summary of the technical analysis of both the existing and projected roadway network performances in this area.

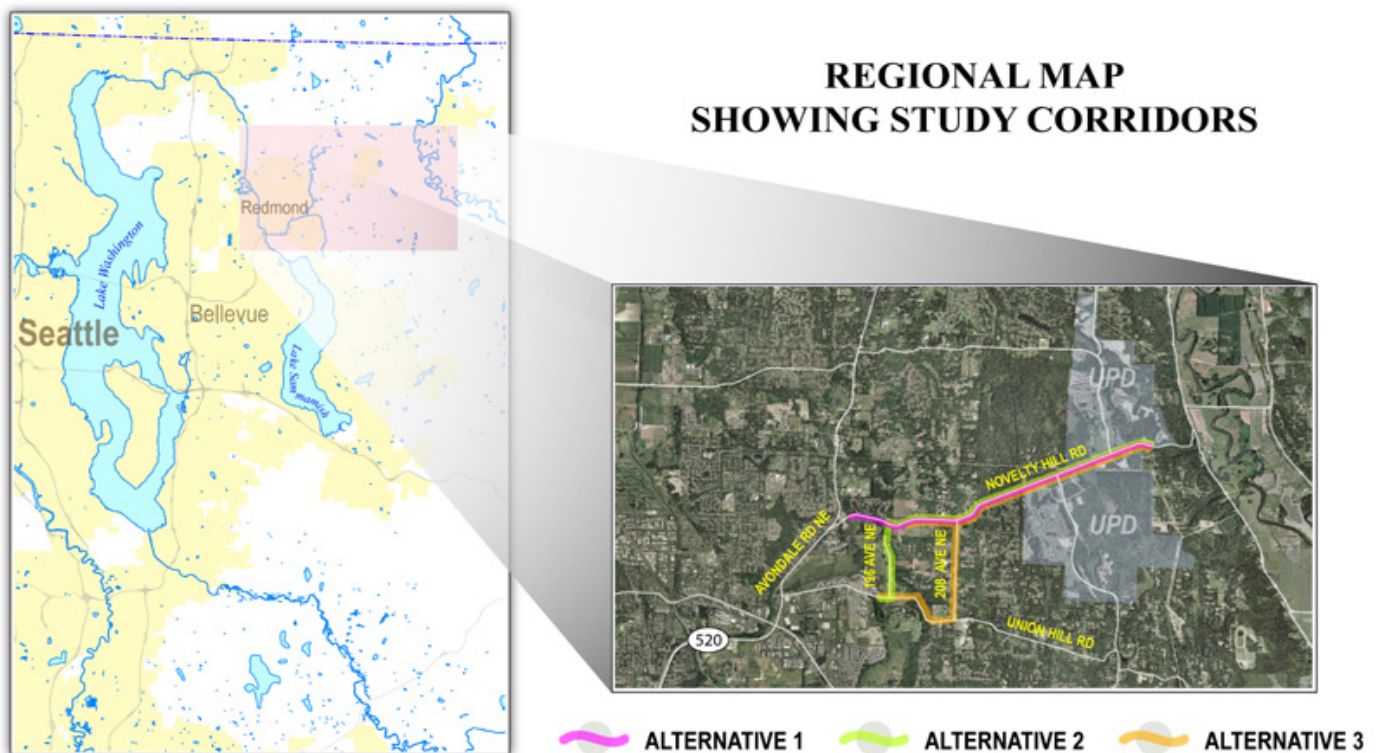
This Transportation Discipline Report compiles transportation engineering technical information into a comprehensive document that compares improvement alternatives. It quantifies costs, benefits, and implications of alternatives to aid in determining which should become the preferred improvement.

The principal roadway servicing the Bear Creek Planning Area is NE Novelty Hill Road. Although this analysis takes its name from this corridor, improvements to NE Novelty Hill Road itself are only one of three proposed improvement alternatives studied with this effort.

In recent years, the corridor has become a major commute route from growing residential neighborhoods, including the urban planned development (UPD) communities, Redmond Ridge and Trilogy. Members of these growing communities travel to employment and business centers in both Seattle and the Eastside.



After a screening and alternative development process detailed in Sections 3.3 and 3.4, three alternative roadway corridors in the Bear Creek Planning Area were examined for potential improvements (see the figure below). Operational performance analysis was performed for potential improvements to the NE Novelty Hill Road corridor, to 196th Avenue NE, to 208th Avenue NE, and to NE Union Hill Road. Comparative analysis was also developed for a No-Action Alternative. In addition, this report examines Transportation Demand Management, Intelligent Transportation Systems, safety, and construction issues.



What are the three build alternatives?

Alternative 1 (NE Novelty Hill Road) is 3.9 miles long. It consists of five lanes along NE Novelty Hill Road from Trilogy Parkway NE to Avondale Road NE.

Alternative 2 (196th Avenue NE) is 4.3 miles long. It consists of five lanes along NE Novelty Hill Road from Trilogy Parkway NE to

1 196th Avenue NE. Alternative 2 continues with two lanes to
2 Avondale Road NE and three lanes along 196th Avenue NE from
3 NE Novelty Hill Road to NE Union Hill Road. NE Union Hill Road
4 continues with five lanes from 196th Avenue NE to the Redmond
5 city limits at the Evans Creek Bridge.

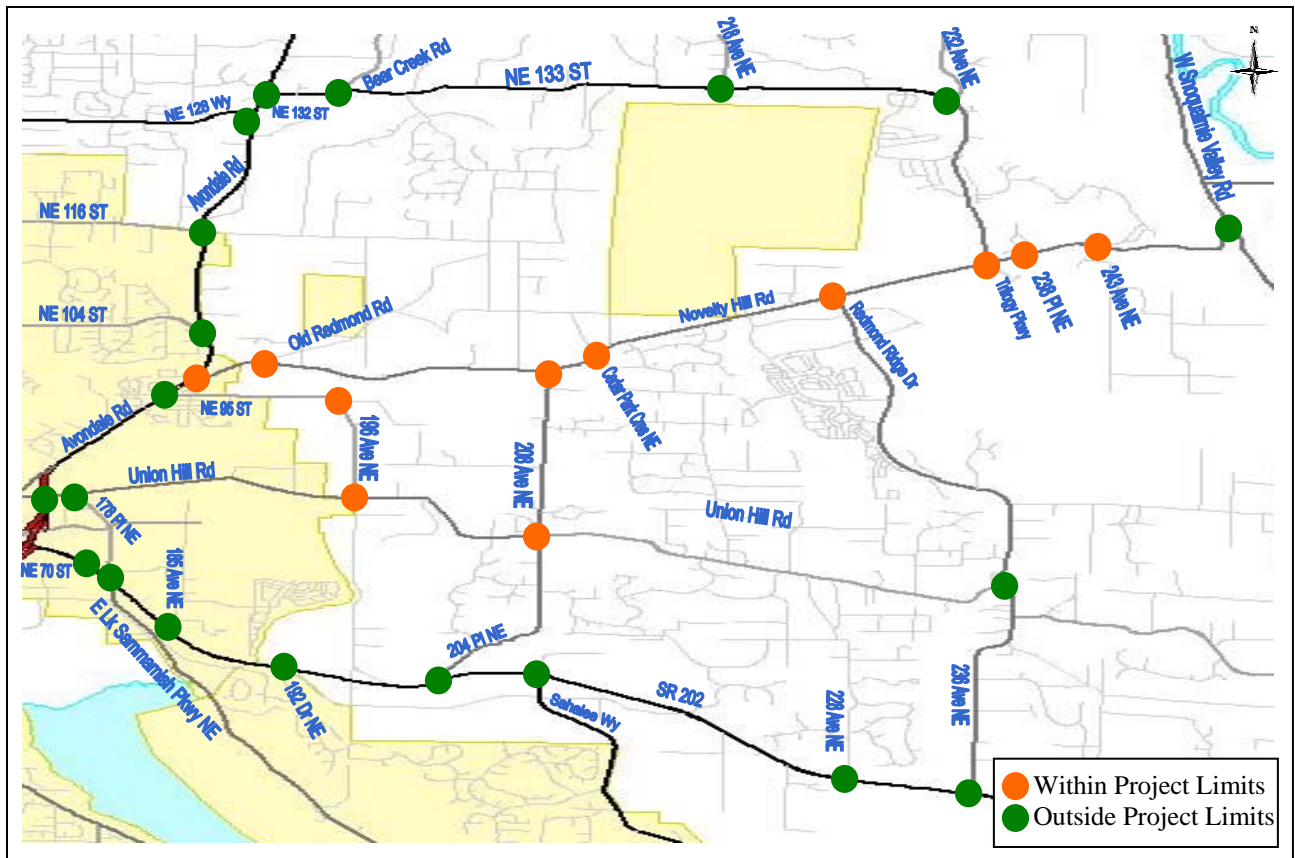
6 Alternative 3 (208th Avenue NE) is 5.5 miles long. It consists of five
7 lanes along NE Novelty Hill Road from Trilogy Parkway NE to
8 208th Avenue NE. Alternative 3 continues with three lanes from
9 208th Avenue NE to 3,000 feet westerly and three lanes on 208th
10 Avenue NE from NE Novelty Hill Road to NE Union Hill Road. NE
11 Union Hill Road continues with five lanes from 208th Avenue NE to
12 the Redmond city limits at the Evans Creek Bridge (except there
13 would be four lanes for the 2,500-foot hill-climb segment).

14 Each of the proposed build alternatives includes culvert
15 replacements, stormwater detention and water quality facilities, and
16 pedestrian and bicycle facilities.

17 **What analyses were performed?**

18 Technical analysis began with the travel forecast model development
19 and study that is detailed in the Transportation Planning chapter of
20 this report (Chapter 3). This analysis employed a localized version of
21 the regional travel forecast model to analyze trip origin, destination,
22 and routing. The analysis was conducted for the existing condition
23 and each of the four future improvement alternatives (the three build
24 alternatives plus the No-Action Alternative).

25 The forecast data were used extensively to develop the Chapter 4
26 Traffic Analysis. With a collection of existing and projected roadway
27 geometries, the modeling software Synchro was used to analyze
28 intersection performance throughout the study area in all scenarios.
29 Intersections both within and outside of the project limits were
30 analyzed to show impacts throughout the study area, as shown on the
31 Existing Intersections figure. Queue length, vehicle delay, travel
32 times, and localized intersection lane assignment alternatives were
33 analyzed in present day conditions and, with forecast data, in the
34 four future improvement alternatives. The traffic analysis also
35 included technical analysis of high accident locations in the study
36 area.



Existing Intersections

20 Specific channelization and access management alternatives were
 21 also analyzed as part of Chapter 4. In addition, there is an analysis of
 22 the potential for roundabout designs and for the use of Intelligent
 23 Transportation System devices. Section 4.8 is devoted specifically to
 24 the study of Transportation Demand Management actions and
 25 strategies, including a focused analysis of transit and high-occupancy
 26 vehicles (HOVs).

27 The Road Design chapter (Chapter 5) undertakes an analysis of
 28 bicycle and pedestrian facilities, bridge design options, and safety
 29 design. Construction and maintenance costs and project impacts to
 30 the community, natural resources, and affected utilities were also
 31 evaluated.

32 The Construction Issues chapter (Chapter 6) offers a comprehensive
 33 analysis of construction impacts. Included in the analysis is a look at
 34 the potential mitigation for each alternative's effects on schools,
 35 emergency services, utilities, erosion control, and critical areas

protection. This chapter also discusses mitigation for the haul routes and even for the probable staging areas for project development.

The technical analyses were conducted to statistically explore and quantify as many of the transportation issues as is practical. The analyses are structured to allow a direct comparison between alternatives on the critical aspects of the circulation system, such as comparative traffic level of service (LOS) performances at key intersections between the alternatives.

Traffic Analysis Data

Traffic analysis examines traffic demand rates, patterns, and incidents to determine the best methods and configurations to improve a road's performance and safety. These parameters are rated in terms of level of service (LOS), travel time, number of vehicles the road is servicing (referred to as traffic loading), and accident reduction. The following sections provide the results of that analysis for the alternatives.

Travel Time

From the table below entitled "2030 PM Travel Time," the best improvement of travel time compared to the No-Action Alternative is along the Alternative 2 corridor, which would decrease travel time from State Route (SR) 520 to the UPDs by 2.7 minutes (13.5 minutes compared to 16.2 minutes under No-Action). This is a reduction of approximately 17 percent compared to the No-Action Alternative. Note that these travel times are for idealized conditions and assume other presently planned area improvements are completed. Therefore, these times should be used for relative comparisons between the alternatives, as the actual travel times will vary from these.

2030 PM Travel Time (In Minutes)						
On	From	TO	No- Action	Alt 1	Alt 2	Alt 3
Novelty-Avondale	SR 520	UPD	16.2	17.3	14.3	14.5
Avondale	SR 520	NE 132nd St	15.5	16.3	13.8	14.9
Novelty-208th-Union Hill	SR 520	UPD	15.5	14.0	14.0	14.0
Novelty-196th-Union Hill	SR 520	UPD			13.5	

2030 AM Travel Time (In Minutes)						
On	From	To	No	Alt	Alt	Alt
			Action	1	2	3
Novelty-Avondale	UPD	SR 520	15.8	13.5	12.1	12.6
Avondale	NE 132nd St	SR 520	13.1	13.1	11.6	12.4
Novelty-208th-Union Hill	UPD	SR 520	19.5	14.0	15.8	13.4
Novelty-196th-Union Hill	UPD	SR 520			14.1	

The travel times reflect some improvements, but the actual improvement is dampened by the increased traffic deciding to travel the improved routes rather than alternative routes.

Traffic Loading

The table below entitled “2030 Average Daily Traffic Loading” shows a dramatic change in driving patterns along NE Novelty Hill Road; the number of cars on NE Novelty Hill Road almost doubles when comparing Alternatives 1, 2, and 3 to the No-Action Alternative. This is not an increase due to greater future population—it is an increase from a change in routing. Alternatives that improve the corridor attract more traffic to the corridor, whereas the No-Action Alternative does little to improve the corridor, and therefore less traffic moves along NE Novelty Hill Road. As a result, the improvements not only increase traffic movement along the build alternative alignments but also have a far-reaching and beneficial effect by unloading routes through the area’s neighborhood streets.

The bolded line provides one of the best comparison points that is common to all alternatives and is directly affected by the improvements.

2030 Average Daily Traffic Loading

Location	No-Action	Alt 1	Alt 2	Alt 3
Avondale Rd NE west of NE Novelty Hill Rd	55,100	59,200	52,300	54,700
NE Novelty Hill Rd east of 208th Ave NE	26,400	42,800	42,900	38,600
NE Novelty Hill Rd east of 243rd Ave NE	15,400	19,600	19,700	19,000
NE 133rd St east of Avondale Rd NE	18,200	14,000	15,300	15,800
NE Union Hill Rd east of 196th Ave NE	19,500	16,200	12,700	19,800
SR 202 west of 238th Pl NE	50,000	48,400	47,900	48,500

The movement of traffic away from neighborhood streets to the arterial route improved by this project can be summarized as follows:

- Less traffic on neighborhood streets.
- Traffic stays on facilities designed to handle that type of volume, not on neighborhood streets.
- Fewer driveway-related accidents; arterials have fewer driveways than neighborhood streets, resulting in fewer chances of driveway-related accidents.
- Safer for pedestrian and nonmotorized users.
- Improves character of neighborhood.
- Fewer neighborhood traffic issues.
- Less need for neighborhood traffic control.
- Less need for expensive and intrusive pedestrian and nonmotorized facilities (e.g., wider shoulders; curb, gutter, and sidewalk; separated pathway or trails on a greater number of streets).
- Better utilization of arterial facilities.
- Less traffic noise in neighborhoods.

Level of Service

The following 2030 PM Level of Service table reflects changes and improvements to the LOS at intersections; LOS is rated on a scale with A being the best and F being the worst. The longer the average wait time at an intersection, the worse the rating becomes. As with travel time, the improvement of intersection performance is dampened by the increased number of vehicles traveling the route compared to the No-Action Alternative.

1 **PM Level of Service**

Intersection	No-Action		Alt 1		Alt 2		Alt 3	
	LOS	Max Queue	LOS	Max Queue	LOS	Max Queue	LOS	Max Queue
Avondale Rd NE & NE Novelty Hill Rd	F	NBTh 1,489 ft	F	WBLT 1,662 ft	E	NBTh 1,372 ft	F	NB 1,438 ft
NE Novelty Hill Rd & 208th Ave NE	C	EBTh/RT 899 ft	C	EB 700 ft	C	EBTh/RT 864 ft	C	EB 463 ft
208th Ave NE & NE Union Hill Rd	E	EBTh/RT 937 ft	C	EB 517 ft	D	EBTh/RT 772 ft	C	EB 533 ft
Avondale Rd NE & NE Union Hill Rd	F	NBTh 2,345 ft	F	NB 2,588 ft	F	NBRT 3,204 ft	F	NBRT 2,985 ft
196th Ave NE & NE Union Hill Rd	F	NB 218 ft	F	NB 278ft	B	EBTh/RT 725 ft	B	EB 418 ft
196th Ave NE & NE Novelty Hill Rd	--		--		B	EBTh/RT 530 ft	--	

Notes: NB = northbound, SB = southbound, EB = eastbound, WB = westbound
Th = through lane, RT = right-turn lane, LT = left-turn lane

5 **AM Level of Service**

Intersection	No-Action		Alt 1		Alt 2		Alt 3	
	LOS	Max Queue	LOS	Max Queue	LOS	Max Queue	LOS	Max Queue
Avondale Rd NE & NE Novelty Hill Rd	F	SBTh/RT 1,175 ft	F	WBLT 1,671ft	C	SBTh/RT 947 ft	F	SB 1,137 ft
Novelty Hill Rd & 208th Ave NE	D	EBTh 1,085 ft	D	WBLT 974 ft	B	WBLT 483 ft	C	WBLT 751 ft
208th Ave NE & NE Union Hill Rd	F	SBTh/RT 1,428 ft	D	WB 718 ft	F	SBTh/RT 1,133 ft	B	NB 296 ft
Avondale Rd NE & NE Union Hill Rd	F	SBTh/RT 2,115 ft	F	SB 2,316 ft	F	SBTh/RT 1,933 ft	F	SB 2,020 ft
196th Ave NE & NE Union Hill Rd	F	SB 250 ft	F	SB 130 ft	B	WBTh 998 ft	B	WB 709 ft
196th Ave NE & NE Novelty Hill Rd	--		--		B	EBTh/RT 640 ft	--	

Notes: NB = northbound, SB = southbound, EB = eastbound, WB = westbound
Th = through lane, RT = right-turn lane, LT = left-turn lane

1 **Safety**

2 Fifty-three collisions occurred during the 3-year period from 2002 to
3 2004 along NE Novelty Hill Road, resulting in a low accident rate
4 for the corridor of 0.31 accidents per million vehicle miles
5 (acc/mvm). In 2005 the average collision rate in the state for
6 principal arterial roads was greater than 2. Thirty-eight percent of the
7 collisions resulted in injury; the remainder were property damage
8 only accidents. Forty-three percent of the collisions were rear-end
9 accidents.

10 Increasing the number of lanes and improving intersections and
11 alignments is expected to improve safety and reduce accidents. All
12 intersections along an improved corridor would be improved.

13 Road alignment from a safety standpoint is controlled by stopping
14 sight distance (the distance it takes to react and stop a vehicle before
15 a collision occurs) and entering sight distance (the distance for a
16 stopped car to enter a traffic lane and accelerate to posted speed).

17 Road alignment improvements are particularly needed for two road
18 sections.

- 19 ▪ In Alternative 3, a challenging curvilinear alignment is
20 present on NE Union Hill Road east of 199th Avenue NE, as
21 the roadway winds up the hill approaching 208th Avenue NE.
- 22 ▪ In all three alternatives, road alignment improvements are
23 needed at the section on NE Novelty Hill Road east of 208th
24 Avenue NE, as the roadway winds up the hill approaching
25 214th Avenue NE.

26 Beyond these sections, there are other areas of road, particularly at
27 some driveways, where sight distance does not meet current
28 standards.

29 The three build alternatives were designed to help resolve these
30 issues. The No-Action Alternative would leave the deficient sections
31 as they are today.

32 **Construction Cost**

33 The construction costs of the alternatives are as follows:

- | | |
|--------------------------|--------------|
| 34 ▪ Alternative 1 | \$37,600,000 |
| 35 ▪ Alternative 2 | \$48,300,000 |
| 36 ▪ Alternative 3 | \$52,500,000 |

1 These costs do not include right-of-way acquisition, design, and
2 other administrative costs.

3 **Advantages and Disadvantages of Each** 4 **Alternative**

5 The following discussion presents a brief qualitative evaluation of
6 each of the alternatives.

7 **No-Action Alternative**

8 With the No-Action Alternative, travel time along all corridors
9 would continue to degrade, and motorists would increasingly clog
10 neighborhood side streets looking for alternative routes. Use of
11 neighborhood streets would decrease safety in these areas, sending
12 traffic along routes that would have much more friction with
13 residential access and pedestrians. As the area's roadway system
14 improves, NE Novelty Hill Road would become a more evident and
15 dominant blockage to the traffic system.

16 Although the travel times for this alternative are not greatly different
17 from those of the build alternatives under ideal conditions (no
18 accidents, no traffic slowdowns created by curious onlookers or
19 overcautious drivers), it would be much more susceptible to longer
20 and more frequent delays when nonideal conditions exist. The build
21 alternatives have additional lanes that may be used to help bypass
22 these situations, reducing both the number and length of delays. The
23 longer motorists are caught in backups, the lower their patience,
24 leading to greater risk of unwise vehicular maneuvers.

25 There are also major safety improvements needed along sections of
26 NE Novelty Hill Road where sight distances are insufficient. With
27 increased traffic loads and no road improvements, accidents would
28 increase.

29 With increasing levels of traffic and no improvements for pedestrians
30 and cyclists, the street would become an escalating threat and a less
31 desirable route, discouraging these alternative modes of
32 transportation. Without added lane capacity and improved
33 intersection configurations, it would be difficult to develop HOV
34 incentives; queue bypass lanes or similar improvements cannot be
35 developed.

1 **Alternative 1**

2 Alternative 1 is the least costly of the three build alternatives.
3 Alternative 1 is the shortest alternative, resulting in the smallest
4 increase of impervious surface and requiring the fewest structures for
5 crossing streams.

6 Alternative 1 would, however, significantly increase congestion on
7 Avondale Road NE. Presently, Avondale Road NE carries more than
8 40,000 cars per day. Alternative 1 is the only alternative that would
9 increase this loading.

10 The City of Redmond Comprehensive Plan (2005) emphasizes
11 dispersing traffic along multiple routes. The City's plan does not call
12 for improvements along Avondale Road NE or NE Novelty Hill
13 Road from SR 520 to the Redmond city limits at Bear Creek. Lack
14 of improvement by the City to these routes significantly limits the
15 effectiveness of Alternative 1 in moving traffic from the UPDs to
16 SR 520. In 2007 the City will start to study options of providing one
17 HOV lane on Avondale Road NE. If the City decides to install an
18 HOV lane on Avondale Road NE, there may be some relief to the
19 congestion.

20 **Alternative 2**

21 Alternative 2 is the only alternative that adds to the transportation
22 grid. The connection of 196th/195th Avenue NE to NE Novelty Hill
23 Road would provide an alternative access route to the area that does
24 not exist now. At the present time, if the lower portion of NE
25 Novelty Hill Road becomes blocked, the other routes up the hill are
26 longer or more precarious (e.g., NE Union Hill Road hill climb).
27 When Avondale Road NE or the lower portion of NE Novelty Hill
28 Road becomes blocked, the new connection would provide another
29 lifeline route to and from the communities along NE Novelty Hill
30 Road for emergency response services.

31 Alternative 2 and the existing NE Novelty Hill Road would
32 complement each other, particularly during the AM commute, giving
33 drivers a choice of routes. Presently, as drivers approach Avondale
34 Road NE on NE Novelty Hill Road, the AM backup frequently
35 extends beyond the proposed 196th Avenue NE intersection. With
36 the connection of 196th Avenue NE, drivers would have a choice

1 between waiting to get through the NE Novelty Hill Road/Avondale
2 Road NE intersection and traveling down 196th Avenue NE.

3 Alternative 2 also would improve traffic capacity with its first phase
4 of construction. The first phase of Alternatives 1 and 3, however,
5 would largely result in safety improvements along sections of the
6 road with sight distance issues. Under these two alternatives,
7 capacity would not substantially improve until more funding is found
8 to construct the remaining portions of those alternatives. The first
9 phase of Alternative 2 would also improve capacity and access by
10 providing a continuous improved roadway from the Redmond city
11 limits to the connection of 196th Avenue NE with NE Novelty Hill
12 Road.

13 The City's Comprehensive Plan calls for improving NE Union Hill
14 Road to the city limits at Evans Creek to provide for a more
15 dispersed traffic system. Alternative 2 complements the City's
16 planning by providing a connection to NE Union Hill Road.

17 If the City decides to install an HOV lane on Avondale Road NE,
18 Alternative 2 may be modified with an HOV queue bypass lane at
19 the 196th Avenue NE intersection with NE Novelty Hill Road. The
20 queue bypass could allow the passage of HOVs through that
21 intersection to the lower (western) portions of NE Novelty Hill
22 Road. This scenario would make NE Novelty Hill Road a preferred
23 HOV route, and the preferred route for single-occupant vehicles
24 would be 196th Avenue NE.

25 The drawback to Alternative 2 is the need to construct 800 feet of
26 new road, with environmental impacts to a stream and wetland area
27 and the associated cost to mitigate these impacts.

28 **Alternative 3**

29 Alternative 3 would relieve the pressure on the western portion of
30 NE Novelty Hill Road, divert traffic southward towards SR 520, and
31 avoid exacerbating the difficult situation on Avondale Road NE.
32 Straightening of the curves along the hill-climb section of NE Union
33 Hill Road would improve the safety and capacity of that route,
34 opening up travel up the hillside. Improvement of NE Union Hill
35 Road would not only improve access to 208th Avenue NE but also to
36 traffic continuing on NE Union Hill Road. Similar to Alternative 2,
37 this alternative may also work with the concept of the lower portion

1 of NE Novelty Hill Road being enhanced for HOV usage.
2 Alternative 3 would also complement the City's Comprehensive Plan
3 by connecting to NE Union Hill Road.

4 This alternative suffers from its length; some drivers will not attempt
5 the route because of the awkward routing and its length. In addition,
6 the need to close NE Union Hill Road to construct the hill-climb
7 section for a period of approximately 2 years would result in the
8 greatest construction disruption to the community. The communities
9 along 208th Avenue NE are concerned about the impacts to private
10 property that would result from road widening and the increased
11 traffic. Residents are also concerned about children walking along
12 the busy street to and from three nearby schools. Some of this
13 concern may be offset by providing a sidewalk along the east side,
14 and the center turn lane would help relieve congestion caused by
15 traffic into and out of the Bear Creek School.

16 Its length plus the construction of the hill climb make Alternative 3
17 the most expensive of the three alternatives.

18

3. Air Quality

This Air Quality Discipline Report has been prepared for the NE Novelty Hill Road Project, per guidance issued by the Washington State Department of Transportation (WSDOT 2006). The purpose of the report is to provide an evaluation of existing air quality in the project area, analysis of potential air quality impacts during construction and operation of the project alternatives, identification of potential mitigation measures, and determination of conformity with the Clean Air Act.

The purpose of the NE Novelty Hill Road Project is to improve immediate and long-range transportation mobility of people and goods in the NE Novelty Hill Road area within the Bear Creek Planning Area. This area is located between 243rd Avenue NE and Avondale Road NE south of NE 133rd Street to NE Union Hill Road. The proposed project would address current traffic demand and growth to year 2030. The proposed project would connect areas of planned urban density to employment and service centers within the cities of Redmond, Bellevue, and Seattle.

Air pollutants evaluated for such projects located in the Puget Sound area include particulate matter (PM), ozone precursors such as nitrogen oxides (NO_x) and volatile organic compounds (VOC), and carbon monoxide (CO). CO, NO_x, and VOC emission sources related to the proposed project would be vehicle emissions during both construction and operation phases as well as heavy-duty diesel construction equipment during construction. Particulate matter includes total suspended particulate (TSP), particles less than 10 micrometers in size (PM₁₀), and fine particles less than 2.5 micrometers in size (PM_{2.5}). Particulate matter emission sources related to the project alternatives would include vehicle exhaust (particularly diesel exhaust) during both construction and operation phases and fugitive dust during construction.

Air quality in the project area is regulated by the U.S. Environmental Protection Agency (EPA), Washington State Department of Ecology (Ecology), and Puget Sound Clean Air Agency (PSCAA). Under the

1 Clean Air Act, the EPA has established National Ambient Air Quality
2 Standards (NAAQS). The EPA further designates geographic areas
3 with respect to compliance with the NAAQS. The project area is
4 located within or adjacent to the Puget Sound maintenance area for
5 CO and in attainment areas for all other criteria air pollutants.

6 Because of the location of the project area in maintenance and
7 attainment areas, existing air quality in the project area is likely to be
8 in compliance with the NAAQS. While no ambient air quality
9 monitoring stations are located in the project area itself, data
10 collected from the nearest monitoring stations provide evidence that
11 existing air quality is in compliance with the NAAQS. Land use in
12 the project area is mostly residential, where the major emission
13 sources are motor vehicles and residential wood burning.

14 Computer modeling is the preferred analytical tool of the EPA for
15 evaluating potential air quality impacts from transportation projects.
16 CO emissions and ambient concentrations have been predicted with
17 the MOBILE6.2 and CAL3QHC models of the EPA. Modeling
18 techniques and assumptions are consistent with guidelines of the
19 EPA, WSDOT, Ecology, the Puget Sound Regional Council (PSRC),
20 and the PSCAA. CO concentrations were predicted at nine
21 signalized intersections for the existing conditions, during 2012 (year
22 of opening), and 2030 (design year) for three build alternatives and
23 the No-Action Alternative. The predicted ambient CO concentrations
24 for all future alternatives would be less than the NAAQS.

25 The proposed project would be a regionally significant transportation
26 project located within the CO maintenance area. Conformity
27 determinations are generally the responsibility of the National and
28 State Environmental Policy Act (NEPA/SEPA) lead agency and are
29 conducted during the NEPA/SEPA process. The proposed project is
30 included in both the regional transportation plan and improvement
31 program. Because the proposed project is included in the current
32 conforming Transportation Improvement Program (TIP), the
33 NE Novelty Hill Road Project conforms to the current State
34 Implementation Plan (SIP) for CO. The project-level analysis
35 predicted that CO concentrations resulting from the proposed project
36 would not exceed the NAAQS under any of the project alternatives.
37 Therefore, the proposed project was found to conform to the purpose
38 of the current SIP and to all requirements of the Clean Air Act
39 Amendments of 1990 and the Clean Air Washington Act of 1991.

1 Construction activities would intermittently generate fugitive dust,
2 construction equipment diesel engine exhaust, and odors, which
3 would be most noticeable at locations adjacent to construction sites.
4 Potential construction impacts would be considered short-term or
5 temporary impacts and would occur only while construction work is
6 in progress. The types of construction emissions would be similar
7 under the three build alternatives, while construction emissions from
8 the No-Action Alternative would be considerably less. Construction
9 activities would include mitigation measures to reduce fugitive dust,
10 odors, and exhaust and would comply with the applicable regulations
11 to minimize dust emissions. Construction activities would include
12 best management practices (BMPs) to reduce fugitive dust and
13 engine exhaust. Mitigation measures would not be required during
14 operation of the build alternatives because predicted future CO
15 concentrations would be less than the NAAQS.

16 Toxic compounds emitted from highway vehicles and non-road
17 equipment are known as mobile source air toxics (MSAT). EPA
18 models and standards for MSAT are currently not available to
19 evaluate the site-specific concentrations and potential health impacts
20 of MSAT under the project alternatives. The alternatives are not
21 expected to result in any appreciable differences in overall future
22 MSAT emissions because the estimated future vehicle miles traveled
23 (VMT) under each alternative would be nearly the same. There could
24 be slightly elevated but unquantifiable increases in MSAT emissions
25 to residents and others in a few localized areas where average daily
26 traffic (ADT) on adjacent streets would increase or travel lanes
27 would be moved closer to sensitive land uses. Under all project
28 alternatives, the overall future MSAT emissions would likely be
29 lower than current levels as the result of the national control
30 programs of the EPA. The EPA has issued a number of regulations
31 that will decrease MSAT through cleaner fuels and cleaner engines.

4. Noise

Introduction

This discipline report presents information on potential environmental concerns relating to environmental noise on properties affected by or potentially having an effect on the NE Novelty Hill Road Project because of the presence of traffic and/or construction noise. Proposed improvements include construction of one of three build alternatives. A No-Action Alternative is also evaluated.

The findings and discussion presented in this Noise Discipline Report are based on preliminary project design drawings and information available as of June 2006. Impacts and mitigation will be better determined once the design is further refined and allows assessment of specific construction practices.

King County is considering roadway improvements within an area bounded by NE Novelty Hill Road to Avondale Road NE in the city of Redmond; State Route (SR) 520 (western terminus); and the intersection of NE Novelty Hill Road and 243rd Avenue NE (eastern terminus). The southern boundary is NE Union Hill Road from about Evans Creek to just east of 208th Avenue NE (see Figure 2-1). This area makes up what is referred to as the project area.

The study area for this Noise Discipline Report includes the project area as well as the area within 300 feet of the three project alternative alignments. The study area was divided into segments, termed “noise impact communities” to facilitate organization of noise impacts on the project as required by Washington State Department of Transportation (WSDOT). Each study area segment was subjected to a research method consisting of field

reconnaissance, including noise measurements, and a computer model specific to the proposed roadway improvements.

A total of 28 sites were identified as being representative of the noise-sensitive receptors during initial research. Twelve sites were identified as suitable for field measurements. Additionally, sixteen properties were found to be unique or representative of a number of other nearby receptors.

Impacts

Construction Noise

Construction noise could be reduced if the County recommends the use of high-performance silencers on engines and quieter equipment or construction practices. Also, turning off equipment when not in use would reduce noise levels. To reduce construction noise at nearby receptors, construction-industry best management practices would be incorporated into construction plans and contractor specifications.

Operational Noise

For the purpose of this analysis, noise-sensitive receptors in the project area were grouped into four communities:

- Receptors along NE Novelty Hill Road are the NHR Community
- Receptors along NE Union Hill Road are the UHR Community
- Receptors along 196th Avenue NE are the 196th Community
- Receptors along 208th Avenue NE are the 208th Community.

Determination of impact is by comparison of future noise levels to existing conditions.

Under the No-Action Alternative, there would be no physical change to the roadway network. All changes in traffic noise levels are due solely to differences in traffic volumes.

- NHR Community: Noise levels range from 63 dBA at Receptor 11 to 72 dBA at Receptor 5. Noise level increases range from 0 to 3 dB.

- 1 ▪ UHR Community: Noise levels range from 62 dBA at
2 Receptor 28 to 64 dBA at Receptor 23. Noise level increases
3 range from -1 to 0 dB.
- 4 ▪ 196th Community: Noise levels range from 52 dBA at
5 Receptor 15 to 62 dBA at Receptor 17. Noise level increases
6 range from 1 to 2 dB.
- 7 ▪ 208th Community: Noise levels range from 51 dBA at
8 Receptor 18 to 63 dBA at Receptor 22. Noise level increases
9 were predicted to be 2 dB.

10 Under Alternative 1, only NHR would be physically changed.

- 11 ▪ NHR Community: The highest noise levels and greatest
12 increases for this alternative would be along NHR. Noise
13 levels range from 65 dBA at Receptor 9 to 77 dBA (a Tier 2
14 substantial exceedance) at Receptor 3. Noise level increases
15 range from 2 to 8 dB.
- 16 ▪ UHR Community: Least affected under this alternative.
17 Noise levels range from 62 dBA at Receptor 28 to 64 dBA
18 at Receptor 26. Noise level increases range from -1 to 0 dB.
- 19 ▪ 196th Community: Noise levels range from 52 dBA at
20 Receptor 15 to 62 dBA at Receptor 17. Noise level increases
21 range from 1 to 2 dB.
- 22 ▪ 208th Community: Noise levels range from 51 dBA at
23 Receptor 18 to 63 dBA at Receptor 22. Noise level increases
24 were predicted to be 2 dB.

25 Under Alternative 2, only NHR, 196th, and a few hundred feet of
26 UHR would be physically changed. Traffic volumes on 196th would
27 increase dramatically as 196th would be widened to three lanes and a
28 new section of roadway would be built to connect 196th and NHR.

- 29 ▪ NHR Community: Noise levels would be very similar to
30 Alternative 1. Noise levels range from 65 dBA at Receptor 9
31 to 77 dBA (a Tier 2 substantial exceedance) at Receptor 13.
32 Noise level increases range from 1 to 8 dB.
- 33 ▪ UHR Community: Least affected under this alternative.
34 Noise levels range from 62 dBA at Receptor 28 to 64 dBA
35 at Receptor 26. Noise level increases range from -1 to 0 dB.
- 36 ▪ 196th Community: Greatest change under Alternative 2.
37 Noise levels would be 67 to 70 dBA, and change by 9 to 17
38 dB when compared to existing conditions. This is due to the
39 high traffic volumes and new section of roadway on 196th.
40 At a 17 dB increase, Receptor 15 is considered a substantial
41 (Tier 2) noise increase by WSDOT.

- 208th Community: Noise levels range from 51 dBA at Receptor 18 to 62 dBA at Receptor 22. Noise level increases were predicted to be 1 to 2 dB.

Under Alternative 3, NHR, 208th, and a few hundred feet of UHR would be physically changed. Traffic volumes on 208th would increase dramatically as 208th would be widened to three lanes.

- NHR Community: Noise levels would be high, but not as high as Alternative 1 except in the area near the intersection with 208th. Noise levels range from 65 dBA at Receptor 9 to 91 dBA at Receptor 13, a 19-dB increase. Receptor 13 represents those homes on NHR near the intersection with 208th that are exposed to high traffic volumes from both NHR and 208th. At a 19-dB increase, Receptor 13 is considered a severe noise increase (> 80 dBA) by WSDOT.
- UHR Community: Least affected under this alternative. Noise levels range from 65 dBA at Receptor 27 to 67 dBA at Receptors 26 and 28. Noise levels would change by 2 to 4 dB, with two new impacts of 67 dB.
- 196th Community: Noise levels would be 59 to 61 dBA (no impacts), and change by 0 to 9 dB compared to existing conditions.
- 208th Community: Little change under Alternative 3. Noise levels range from 52 dBA at Receptor 18 to 64 dBA at Receptor 22. Noise levels would change by 3 dB, with no impacts.

Mitigation

The NE Novelty Hill Road Project is designed to increase the capacity of the road network in the project area. To provide that capacity, the proposals provide additional lanes of travel, necessitating widening of the roadways. The combination of widening the pavement and increasing the vehicle density results in traffic noise impacts, some of them “substantial” (10 dBA L_{eq} above existing conditions) or “severe” (> 80 dBA L_{eq}) by WSDOT definition, and many in excess of 72 dBA L_{eq} at the first row of residential receptors. Of the six mitigation methods available for consideration, only noise barriers could provide substantial noise reduction under these conditions.

Every part of the project area with predicted noise impacts was examined for feasibility of noise walls. Each of the examined areas

1 was determined to be unsuitable for the construction of noise walls
2 for one or more of the following reasons:

- 3 ▪ Widening of the roadways has reduced the available right-
4 of-way to the point where insufficient space exists to
5 construct and maintain noise walls without removing the
6 structures the walls would be built to protect. Much of
7 NHR, particularly near the intersection with 208th, fits this
8 description.
- 9 ▪ Noise barriers must be unbroken to function properly. They
10 cannot accommodate access such as driveways and
11 intersections. Most of the roadway frontage to be improved
12 is too dense with intersections and required access to homes
13 and businesses to build a wall of sufficient length to provide
14 the minimum required noise benefit. All of 196th, 208th,
15 and UHR are in this category.
- 16 ▪ The project area has complex undulating terrain, or terrain
17 elevated as much as 20 feet above the roadway, immediately
18 adjacent to the roads to be improved. It is not feasible to
19 build a wall of safe height under these conditions. NHR
20 from NE Redmond Road to 208th is in this category.

21 As the result of this analysis, no mitigation is proposed.

5. Geology and Soils

Introduction

The proposed project is to improve immediate and long-range transportation mobility of people and goods in the NE Novelty Hill Road corridor. The proposed project would address current traffic demand and future growth to 2030, as projected by the 2004 King County Comprehensive Plan. The project would connect areas of planned urban density to employment to and service centers in the cities of Redmond, Bellevue, and Seattle.

In support of the NEPA/SEPA EIS, a Geology and Soils Discipline Report is required to aid in development and evaluation of alternatives. This report identifies the geologic conditions and associated impacts and mitigation measures relative to the proposed alternatives. Four alternatives are being considered for environmental review. In addition to considering the No-Action Alternative, King County is evaluating three build alternatives. For convenience and better understanding of the components of the three build alternatives, the alternatives have been broken into segments as shown in Figure 2-2.

Description of Alternatives

No-Action Alternative

Although routine scheduled maintenance of the roadway will continue, no new improvements are proposed under this alternative.

Alternative 1: NE Novelty Hill Road (Segments 1A, 1B, and 1C)

NE Novelty Hill Road would be widened to five lanes from Avondale Road NE to 243rd Avenue NE.

**Alternative 2: NE Novelty Hill Road, 196th Avenue NE,
and NE Union Hill Road (Segments 1A, 1B, and 2A)**

NE Novelty Hill Road would be widened to five lanes from 196th Avenue NE to 243rd Avenue NE (Segments 1A and 1B). In addition, starting at the intersection of 196th and NE Novelty Hill Road, NE Novelty Hill Road would taper to two lanes from five lanes in a westerly direction over a distance of approximately 1,000 feet. NE Union Hill Road would be expanded to five lanes from the Redmond city limit to 196th Avenue NE. North of NE Union Hill Road, 196th Avenue NE would be widened to three lanes from two lanes to NE Novelty Hill Road, with approximately 800 feet of new roadway linking NE 95th Street to NE Novelty Hill Road (Segment 2A).

**Alternative 3: NE Novelty Hill Road, 208th Avenue NE,
NE Union Hill Road (Segments 1A, 3A, 3B, and 3C)**

East of 208th Avenue NE, NE Novelty Hill Road would be widened to five lanes to 243rd Avenue NE (Segment 1A). West of 208th Avenue NE, NE Novelty Hill Road would narrow and continue west as three lanes for approximately 3,000 feet (Segment 3A), then would taper to two lanes from three over a distance of approximately 600 feet. NE Union Hill Road would transition from five lanes at the intersection to four lanes as it ascends to the top of a steep hillside (referred to as the hill-climb area) and then back to five lanes to 208th Avenue NE (Segment 3C).

As can be seen in the description of the three build alternatives, they have both common and unique project features. The common proposed improvements, in Segment 1A, involve widening of NE Novelty Hill Road in the upland areas of Bear Creek Plateau. The unique aspects of the project alternatives revolve around improvements to the different corridors used to connect from the lowlands of the Bear-Evans Creek Valley to the upland portion of NE Novelty Hill Road on the Bear Creek Plateau.

The No-Action Alternative does not involve any new construction activities but does continue regular scheduled road maintenance.

Construction activities associated with all three build alternatives include clearing and grading, construction of multiple retaining walls, installation of new culverts, and bridge replacement. Except for 800 feet of undeveloped property associated with Alternative 2

(in Segment 2A), the majority of the road widening would occur along the existing road alignments.

Affected Environment

The project area lies within the lowlands of the Bear Creek Valley and Evans Creek Valley to the west and the uplands of the Bear Creek Plateau to the east. Glacial erosion and deposition, along with nonglacial depositional processes, shaped the landscape and material deposits of the project area.

Geologic units identified along the project alignment can generally be divided into two categories. The first consists of recessional outwash and alluvial deposits of loose to medium dense, relatively clean sands and gravels found in the Bear Creek and Evans Creek Valleys. The second category is glacial till deposits consisting of unsorted, heterogeneous, dense to very dense mixture of clay, silt, sand, and gravel found in the upland areas of the Bear Creek Plateau. On the hillsides that transition from the valleys to the plateau, soils consisting of dense to very dense silts, sands, and gravels are encountered.

Scattered throughout the uplands of the Bear Creek Plateau are localized wetlands formed in the closed depression of the moderately rolling terrain. Subsurface investigations of adjacent wetlands encountered deposits of organic soils with thin partings of peat, generally 1 to 2 feet thick. However, a thicker peat deposit was encountered underlying approximately 500 linear feet of NE Novelty Hill Road just east of 214th Avenue NE in Segment 1A. In this section of the roadway, subsurface testing indicates that 5 feet of the loose silty sand fill overlies as much as 6 feet of fibrous peat.

Based on available subsurface information, groundwater levels in the valley areas typically range from 9 to 15 feet below ground surface. When encountered, groundwater levels on the Bear Creek Plateau were closer to the surface and generally range from 2 to 6 feet below ground surface. The higher groundwater levels were due to perched conditions created by the low permeable glacial till.

Groundwater in localized perch conditions, as found on top of the glacial till interface, can vary widely, especially in the wet season.

Alternative 1 requires the replacement of Novelty Hill Bridge 119A, whereas construction of Alternatives 2 and 3 would replace Union

Hill Bridge 952A. Representatives from the geotechnical consulting firm Shannon & Wilson, Inc. completed a general geologic evaluation of King County bridge sites in 1993 and found the potential for liquefaction to be high at both bridge sites. More recent USGS liquefaction mapping by Palmer in 2002 indicates the lowland areas of the project site have liquefaction susceptibility of low to moderate. Previous subsurface information near the bridge sites confirmed the presence of alluvial and recessional deposits of sands and gravels underlying the general areas of both bridges. However, additional subsurface borings and geotechnical analysis at the project design stage will be required to determine the extent of potentially liquefiable soils.

The King County Critical Areas Ordinance indicates erosions and landslide hazard areas exist on the steep hillside slopes of NE Novelty Hill Road in Segments 2A and 3A and along the steep escarpment of NE Union Hill Road within Segment 3C of Alternative 3. All soils on slopes steeper than 40 percent have high potential for erosion. Soils on slopes inclined between 15 and 40 percent may have a medium or high erosion potential, depending on the character of the soils.

Impacts

From a geotechnical perspective, all the build alternatives are feasible and involve typical road widening activities, including clearing and grading, constructing retaining walls, replacing culverts, and replacing bridges. Impacts associated with these activities from a soils and geology perspective include construction, operational, indirect, and cumulative impacts. Construction conditions associated with soils and geology along the roadway alignments of the three proposed build alternatives are typical of conditions routinely encountered on King County road construction projects. Therefore, no adverse soil and geology impacts are anticipated as long as standard King County design and construction practices are followed for the project.

Construction Impacts

No-Action Alternative

Construction impacts are temporary impacts that take place during or for a short time after construction. For the No-Action Alternative, no

new road improvements are proposed. Therefore, impacts would be associated with regular road maintenance activities such as ditch cleaning and culvert maintenance. Potential impacts associated with ditch and culvert maintenance include increased erosion and sedimentation of surface waters from removal of sloughed materials.

Build Alternatives

While it is anticipated that construction impacts would be similar for the three build alternatives, the magnitude of impacts would be greater as the size of the construction area and scope of project improvements increase. Due mainly to the height and length of the retaining walls along the hill-climb portion of NE Union Hill Road, project improvements associated with Alternative 3 would be significantly greater than those associated with Alternatives 1 and 2. Improvements to Alternative 2 would be moderately greater than Alternative 1. Potential construction impacts associated with the three build alternatives include the following:

- Clearing and grading may significantly increase transport of sediment downslope and into sensitive areas such as wetlands and streams.
- Landslides may be triggered by modification of surface flows, excavation at the toe of slopes, clearing of trees and vegetation, and vibration of construction equipment.
- Heavy construction equipment or the use of driven piles for bridge foundations or soldier pile walls may create vibration and noise issues.
- Removal of construction spoils may result in offsite tracking of sediment, increased traffic delays due to construction vehicles, and potential for windshield damage from mud and debris.
- Heavy construction traffic may cause premature degradation of the existing pavements on local roads and haul routes.
- Dewatering, if discharged onto embankments, of trench and foundation excavations may result in sedimentation of nearby wetlands, temporary alteration of groundwater flows, or slope stability issues.

Operational Impacts

Operational impacts are the long-term impacts that take place after construction and are associated with normal performance of the constructed road.

No-Action Alternative

For the No-Action Alternative, no new road improvements are proposed beyond regular scheduled maintenance. Therefore, no new geology- or soils-related operational impacts or mitigation measures would be generated. Ongoing maintenance of unstable slopes along the hill-climb portions of NE Novelty Hill Road and NE Union Hill Road are anticipated.

Build Alternatives

As with the construction impacts, long-term operational impacts related to all three build alternatives are anticipated to be similar in nature, although the magnitude of impacts may be greater for different alternatives as the size of the construction area and scope of project improvements increase. Potential operational impacts associated with the three build alternatives include the following:

- Added impervious surface may increase downstream erosion and sedimentation or cause instability if allowed to flow onto steep slopes.
- Failure to remove vegetation, topsoil, and other deleterious material during site preparation and to properly compact the subgrade could lead to long-term settlement and premature degradation of the roadway.
- Poor foundation preparation of bridges and retaining walls could lead to failure that may have negative impacts to the roadway or adjacent structures.
- Retaining walls, embankments, utilities, bridges, and the roadways located in the lowlands are subjected to liquefaction and impacts that include lateral spreading, differential settlement, and deformation.
- A seismic event of significant intensity may trigger landslides in steep slopes or unstable ground areas that may result in damage to roadways or adjacent properties.

1 **Indirect Impacts**

2 Indirect impacts are secondary in nature and result in future impacts
3 to air, water, and other natural systems because of changes in areas
4 such as land use, population density, or growth rate. No geology- or
5 soil-related indirect impacts are anticipated with any of the
6 alternatives.

7 **Cumulative Impacts**

8 Cumulative impacts are impacts associated with incremental
9 consequences that build from past and future actions.

10 **No-Action Alternative**

11 For the No-Action Alternative, no new road improvements are
12 proposed beyond regular scheduled maintenance measures such as
13 ditch cleaning and pavement rehabilitation. Therefore, no geology-
14 or soils-related cumulative impacts are anticipated.

15 **Build Alternatives**

16 Temporary cumulative effects could occur if other earthwork
17 projects in the vicinity of the project alternatives were built around
18 the same time as silt-producing construction and maintenance
19 activities. This could increase the cumulative intensity or duration of
20 construction-and maintenance-related erosion impacts. Paving would
21 add to the impervious surface area of regional development.

22 Construction of any of the three build alternatives would require a
23 large net import of borrow material (sand and gravel) for use as fill,
24 therefore contributing to the depletion of existing borrow sources
25 over time and to increased cost in areas such as fuel and truck travel
26 time. Consumption of aggregates from local suppliers may result in
27 shortages of local aggregate for future projects. Lack of local
28 aggregate would require future projects to require materials from
29 more remote sources and likely increase costs in areas such as fuel
30 and truck time.

31 **Mitigation of Impacts**

32 Proposed mitigation measures are based on well-established King
33 County design and construction practices. Adverse construction,
34 operational, and cumulative impacts are not anticipated as long as
35 established standards and project- specific mitigation measures are
36 followed.

1 **Construction Mitigation**

2 Construction mitigation measures are used to eliminate or reduce
3 direct soil and geology impacts from road construction activities
4 such as clearing and grading. Required mitigation measures needed
5 to address impacts will continue to evolve throughout the design and
6 construction of the selected alternative.

7 **No-Action Alternative**

8 Erosion sedimentation control (ESC) construction best management
9 practices (BMPs) would control erosion and protect critical water
10 resources from proposed maintenance activities.

11 **Build Alternatives**

12 Potential mitigation measures for the previously mentioned
13 construction impacts include the following:

- 14 ▪ ESC BMPs would control erosion and protect sensitive
15 areas from clearing and grading activities.
- 16 ▪ Appropriate construction practices and inspection would be
17 implemented to prevent landslides that could be caused by
18 modification of surface flows, excavation at the toe of
19 slopes, clearing of trees and vegetation, and vibrations from
20 construction equipment.
- 21 ▪ Acceptable limits for construction-related vibration and
22 noise levels would be established prior to construction and
23 monitored to ensure compliance.
- 24 ▪ To control offsite tracking of sediments, ESC BMPs would
25 be implemented that include rock pads and truck washes. In
26 addition, all loads on trucks would be covered during
27 transport to limit impacts from dust.
- 28 ▪ Prior to construction, a pavement reconnaissance and
29 rehabilitation plan would be required for the roadways that
30 may be affected by heavy truck traffic during construction.
31 Whenever possible, trucks should only be routed on major
32 roadways that have been adequately designed to handle
33 heavy traffic loading.
- 34 ▪ ESC BMPs would be used to prevent sedimentation from
35 entering sensitive areas during dewatering of trenches and
36 foundations. Also, to maintain slope stability, water from
37 trench and foundation excavations would not be discharged
38 onto slopes or behind retaining walls.

Operational-Impacts Mitigation

Mitigation measures for operational impacts are used to eliminate or reduce long-term soils and geology impacts that are usually due to poor design and construction practices. Therefore, many mitigation measures required to address long-term performance impacts overlap with mitigation measures employed to address construction impacts.

No-Action Alternative

No geology- or soils-related operational impacts are anticipated so mitigation would not be required.

Build Alternatives

Potential mitigation measures for the previously mentioned operational impacts include the following:

- Low-impact development (LID) mitigation measures such as pervious pavement road shoulders and bioretention swales may be used to lessen the potential effects of increases in impervious surface.
- To ensure long-term performance of roadways, newly widened and existing road areas and sections with known stability or settlement problems would be stripped, cleared, and compacted to provide a firm and stable subgrade.
- At critical structures such as bridge retaining wall foundations, a geotechnical engineer would need to be onsite to observe and recommended if further overexcavation of the underlying soils is necessary to provide a stable base.
- Bridges and retaining walls would be designed per the current American Association of State Highway and Transportation Officials standards for static and seismic conditions. Structures designed with these guidelines would be able to sustain damage from the design earthquake event while limiting public safety concerns.
- Additional subsurface exploration along with site-specific liquefaction analysis would be required during the design phase to determine the potential impact on structures of lateral spreading and settlement. The effects of soil liquefaction on a foundation can be mitigated by densifying the soil using stone columns or other ground-improvement techniques or by designing a deep pile of foundation.

- 1 ▪ Cut-and-fill retaining walls would be designed and
- 2 constructed to at least maintain or reduce the potential for
- 3 landslide impacts during a significant earthquake event.
- 4 Additional mitigation measures would include complying
- 5 with King County-required set back distances, from the top
- 6 steep slopes, for proposed structures or stormwater
- 7 facilities.

6. Water Resources

The purpose of the NE Novelty Hill Road Project is to improve immediate and long-range transportation mobility of people and goods in the NE Novelty Hill Road corridor area near Redmond, Washington. This Discipline Report examines three different build alternatives, as well as the No-Action Alternative, and determines what effects each alternative will have on water resources (groundwater, surface water, water quality, and floodplains) in the project area. The three build alternatives are made up of segments along NE Novelty Hill Road (Alternatives 1, 2, and 3), NE Union Hill Road (Alternatives 2 and 3), 196th Avenue NE (Alternative 2), and 208th Avenue NE (Alternative 3).

A number of existing studies and documents were used to establish baseline information on existing water resources within the project area. Some of these resources included *Redmond-Bear Creek Valley Groundwater Management Plan*, *Bear Creek Basin Current and Future Conditions Analysis*, *Bear Creek Basin Plan*, *Salmon and Steelhead Habitat Limiting Factors Report for the Cedar-Sammamish Basin*, *Redmond Ridge East and Panhandle Draft Environmental Impact Statement*, and the King County Department of Natural Resources Stream and River Ambient Monitoring Program.

The majority of the project area is within Water Resource Inventory Area (WRIA) 8, and Bear and Evans Creek are the main drainage basins. Groundwater resources in the project area include critical aquifer recharge areas and wellhead protection areas. Residents in the area obtain their drinking water from either public water systems or individual wells. Streams are abundant in the project area. Over 18 streams and tributaries in the Bear-Evans Creek Basin will potentially be affected by at least one of the build alternatives. Bear

1 and Evans Creeks both provide important habitat for Chinook
2 salmon and other anadromous fish species such as coho, sockeye,
3 and kokanee salmon and steelhead trout. The *Bear Creek Basin Plan*
4 designates portions of both Bear and Evans Creeks as regionally
5 significant resource areas due to high levels of fish utilization. For
6 the 2003–2004 water year, the Washington State Department of
7 Ecology rated overall water quality in Bear Creek as “moderate
8 concern” and in Evans Creek as “high concern.” Specific concerns
9 include lower dissolved oxygen concentration, higher temperatures,
10 and higher bacteria concentrations. Portions of Bear and Evans
11 Creeks are 303(d) listed waters due to these problems. Floodplain
12 encroachment in the project area is minimal. The project build
13 alternatives only cross the 100-year mapped floodplain in two
14 locations: Bear Creek at NE Novelty Hill Road (Alternative 1) and
15 Evans Creek at NE Union Hill Road (Alternatives 2 and 3).

16 Impacts on groundwater resources are similar and minimal for all
17 build alternatives. Alternative 1 may have marginally less impacts
18 because it is the shortest length of all three alternatives and would
19 result in the least pollutant-generating surface. Most temporary
20 construction effects can be avoided and minimized using established
21 best management practices. In fact, most of the project area currently
22 lacks stormwater treatment, and construction of any of the
23 alternatives would add stormwater facilities designed to treat runoff
24 for water quality. This treatment would decrease chances of
25 groundwater contamination from roadway spills or pollutant runoff.

26 All build alternatives would affect streams and their buffers, but
27 Alternative 1 has the least direct impact. Alternative 2 has the largest
28 direct impact, mainly due to its interface with streams 08.0107 and
29 08.0107A and because it adds an entirely new stretch of roadway.
30 However, the quality of habitat in these streams is poor and
31 mitigation would provide opportunities to improve habitat in those
32 reaches. Alternative 3 has fewer direct impacts to streams and
33 buffers than Alternative 2, but it is the only alternative that crosses
34 headwater tributaries in the upper reaches of Evans Creek. These
35 tributaries are known to be especially fragile and prone to destructive
36 erosion when disturbed. All build alternatives require a major bridge
37 replacement, Bear Creek Bridge at NE Novelty Hill Road for
38 Alternative 1 and Evans Creek Bridge at NE Union Hill Road for
39 Alternatives 2 and 3. These bridge replacements would have

temporary impacts associated with disturbances during construction, but are expected to improve natural hydraulic processes and habitat access in Bear or Evans Creek once installed.

All three build alternatives increase the amount of impervious surface in the area and have the potential to indirectly affect water quality. Alternative 2 adds the most impervious surface due to a new segment of roadway that is required to connect 196th Avenue NE to NE Novelty Hill Road. Alternatives 1 and 3 add approximately the same amount of impervious surface, less than the amount for Alternative 2. Despite increases in impervious surface, pollutant loading calculations show that pollutant runoff will either decrease or remain constant after project construction for all build alternatives. Stormwater facilities will be designed in accordance with the *King County Surface Water Design Manual* (2005) and the Washington Departments of Ecology and Transportation stormwater manuals and will exceed the requirements in these manuals by treating 133 percent of the added impervious surface rather than just the newly added impervious surface. Additionally, if any impervious surface is added within the Redmond city limits, 200 percent of that added impervious surface would be treated for water quality per the City's standards. On the other hand, one concern is that stormwater discharges and clearing of riparian buffer could lead to increased temperature and decreased dissolved oxygen in receiving waters.

None of the alternatives are expected to negatively affect floodplains in the project area. Based on the HEC-RAS model, replacing the bridge over Bear Creek or Evans Creek will not cause either stream to run higher or cause flooding.

Mitigation goals and measures for this project have been designed using guidance in the *Final Lake Washington/Cedar/Sammamish Watershed (WRIA 8) Chinook Salmon Conservation Plan*.

Conservation measures will be used to avoid and minimize most impacts to water resources. These measures are similar for all alternatives and include using established best management practices, following the *King County Surface Water Design Manual*, and using Low-Impact Development (LID) techniques wherever possible. LID is an approach to developing land and managing stormwater runoff that emphasizes conservation and uses natural landscape features in combination with smaller-scale stormwater controls to mimic the natural hydrological process (Hinman 2005).

1 Impacts that cannot be avoided or minimized will be mitigated for
2 using compensatory mitigation. Some examples of mitigation
3 include treating 133 percent of the added impervious surface
4 (treatment is only required for the added impervious surface),
5 replacing substandard culverts in the project area with fish-passable
6 culverts, replanting degraded riparian buffer with native vegetation,
7 and restoring riparian habitat in streams 08.0107, 08.0107A, and
8 08.0114.

9

10

7. Wildlife, Fisheries, and Vegetation

This Discipline Report describes existing conditions, potential impacts, and measures to mitigate negative impacts to fish, wildlife, and vegetation resources from the NE Novelty Hill Road Project (Project). The purpose of the Project is to improve immediate and long-range transportation mobility of people and goods in the NE Novelty Hill Road corridor area near Redmond, Washington. The proposed Project would connect areas of planned urban density to employment and service centers in the cities of Redmond, Bellevue, and Seattle.

Three build alternatives were chosen for detailed evaluation, including segments along NE Novelty Hill Road, NE Union Hill Road, 196th Avenue NE, and 208th Avenue NE. Alternative 1 is 3.9 miles in length and would involve widening the current facility to five lanes from Avondale Road NE to Trilogy Parkway NE. Alternative 2 is 4.3 miles in length and would involve widening current facilities to five lanes along NE Novelty Hill Road from Trilogy Parkway NE to 196th Avenue NE, continuing with two lanes to Avondale Road NE. Alternative 2 would also involve three lanes along 196th Avenue NE from NE Novelty Hill Road to NE Union Hill Road, and five lanes along NE Union Hill Road from 196th Avenue NE to Evans Creek. Alternative 3 is 5.5 miles in length and would involve a five-lane facility along NE Novelty Hill Road from Trilogy Parkway NE to 208th Avenue NE, three lanes on 208th Avenue NE between NE Novelty Hill Road and NE Union Hill Road, and five lanes on NE Union Hill Road from 208th Avenue NE to Evans Creek (except for the 2,500-foot hill-climb segment where the improvement would be four lanes).

Each of the proposed three build alternatives includes road widening on both sides of the existing roads, culvert replacements, rockery or concrete retaining walls where necessary, stormwater-detention facilities, water-quality treatment facilities, and pedestrian and bicycle facilities. Each of the alternatives would also include stream

1 and wetland mitigation. In addition, Alternative 1 would require the
2 replacement of the existing Bear Creek Bridge, and Alternatives 2
3 and 3 would require the replacement of the existing Evans Creek
4 Bridge.

5 Methods used in this analysis included a combination of an extensive
6 literature search; mapping of wildlife habitats using high-quality,
7 color aerial photographs; and field reconnaissance of streams,
8 wetlands, and upland habitats.

9 The majority of the Project is located within the Lake Washington-
10 Cedar-Sammamish Watershed (Water Resource Inventory Area 8).
11 Bear Creek and Evans Creek are the major receiving waters in the
12 study area, which includes the area directly affected by Project
13 activities, plus a 1-mile surrounding area, with emphasis on affected
14 stream reaches and wetlands. Tributaries to Bear Creek and Evans
15 Creek that intersect the build alternatives include the headwaters of
16 Mackey Creek (Tributaries 08.0117A and 08.0117B), Tributary
17 08.0114, Tributary 08.0107, and Tributary 08.0108. Natural
18 vegetation in the study area is dominated by medium-aged
19 coniferous forest, scrub-shrub and emergent herbaceous-dominated
20 wetlands, fallow pasture, and hardwood-dominated riparian forest.
21 No special status plant species are known to occur in the study area.
22 Wildlife in the study area is typical of lowland western Washington
23 and includes a wide range of amphibians, mammals, and fish
24 commonly found in coniferous forest and streams of eastern Puget
25 Sound. Common amphibians occurring in the study area include
26 northern red-legged frog, Northwestern salamander, and Pacific
27 treefrog. Bird species observed in the study area include red-tailed
28 hawk, great blue heron, mallards, wood duck, green-winged teal,
29 pileated woodpecker, and a wide range of songbirds. More than 20
30 species of mammals occur in the study area, including raccoon,
31 opossum, beaver, Douglas squirrel, black-tailed deer, black bear, and
32 cougar, as well as numerous species of mice, voles, and bats. Special
33 status fish and wildlife species documented in the study area include
34 Chinook salmon (listed as Threatened by National Oceanic and
35 Atmospheric Administration [NOAA] Fisheries), steelhead trout
36 (proposed for listing as Threatened by NOAA Fisheries), coho
37 salmon (federal Species of Concern), bald eagle (listed as Threatened
38 by U.S. Fish and Wildlife Service [USFWS]), great blue heron (King

County protected species), osprey (King County protected species) and western toad (USFWS Species of Concern).

Direct impacts to native vegetation and wildlife habitats from construction are similar under Alternative 3 and Alternative 2, both of which would permanently remove approximately 26.9 acres of native habitats. Alternative 1 would remove the least native habitats—17.8 acres. Direct impacts to fish and aquatic habitat are greatest under Alternative 2, which would affect more than 2,000 linear feet of fish-bearing waters, and least under Alternative 1, which would impact less than 100 linear feet of fish-bearing waters. All three build alternatives would involve in-water work at one location on either Bear Creek or Evans Creek, which are both Class S streams that support Chinook salmon, coho salmon, and steelhead trout.

Direct impacts from Project operation include changes in plant community composition from vegetation management, increased risk of wildlife mortality due to potentially higher traffic speeds and volumes, and potential water quality and hydrology impacts from increased impervious surface area. Stormwater runoff from all build alternatives will be treated with the goal of “no net increase” in pollutants. Pollutant modeling predicts that all three build alternatives will result in a net decrease in annual loads of total suspended solids, total phosphorous, total copper, and total zinc in the study area as a whole. However, there will be net increases in some contaminants in specific sub-basins. Base flow in area streams may be negatively affected by all three build alternatives through loss of groundwater recharge due to increased impervious surface, which would vary from 17 acre-feet per year under Alternative 1, to 23 acre-feet per year under Alternative 2. Potential increases in erosion and scour from increased stormwater runoff will be minimized through design of facilities to comply with Level 2 flow control, per the *King County Surface Water Design Manual*, as well as use of low-impact development (LID) technologies to maximize infiltration.

Indirect and cumulative impacts of the build alternatives include increased competition from noxious weeds, microclimate changes, and loss of habitat to associated development (i.e., continued buildout of Redmond Ridge, Trilogy, and Redmond Ridge East). All of the build alternatives will contribute to ongoing incremental loss

of vegetation, wildlife, and fish resources in the study area. Other current or reasonably foreseeable projects in the study area that are included in the cumulative effects analysis include the Redmond Ridge East (“Panhandle”), Evans Creek realignment, State Route (SR) 520 widening, and widening of NE Union Hill Road in Redmond.

All the build alternatives will cross an identified King County Wildlife Habitat Network once, near the east end of the alignments. Other areas important to wildlife movement include the Bear Creek and Evans Creek riparian zones, the forested slopes above Evans Creek Valley, the Redmond Watershed, and protected habitat areas (mostly wetlands) in the Trilogy and Redmond Ridge Urban Planned Developments (UPDs). Potential construction impacts to wildlife movement and connectivity include disturbance from traffic detours and haul routes, as well as light and glare from construction equipment. Wider roads, presumed higher traffic speeds, and increased traffic volumes following Project completion will reduce the ability of animals to cross the build alternatives successfully.

Potential impacts to special status species include construction (e.g., increased turbidity, noise, etc.) and operation (e.g., additional contaminants and flow from increased impervious surfaces) impacts to listed fish habitat in Bear Creek and Evans Creek, and impacts to potential wetland and upland habitats for the western toad.

Various required and recommended mitigation measures will be implemented to avoid, minimize, and compensate for impacts to vegetation, wildlife, and fish resources. These measures include avoiding critical life history periods for special status species (particularly listed fish in Bear Creek and Evans Creek) during construction, implementing appropriate compensatory wetland mitigation, installing culverts or bridges that allow fish passage at all stream crossings, allowing room for terrestrial wildlife passage under the bridges over Bear Creek and Evans Creek, restoring natural channel alignments for portions of Tributaries 08.0107 and 08.0107A, implementing appropriate erosion and stormwater pollutant control measures, and installing oversize culverts at various locations to maintain and improve wildlife movement through the study area.

8. Wetlands

Would there be any construction impacts?

Under Alternative 1, construction impacts would affect 13 wetlands (Table 1-1) and would result in the permanent loss (filling) and long-term temporary disturbance of an estimated 1.35 acres of wetland. Of this total, approximately 0.71 acre would be permanently filled, 0.61 acre would be temporarily disturbed, and 0.03 acres of indirect impacts would occur during construction. There would be indirect buffer impacts of 2.84 acres. Alternative 1 would have the least amount of impact to the highest category of wetland (Table 1-2, Figure 1) with only 0.36 acre of permanent impact to category I palustrine forested (PFO) wetlands. It would, however, have the largest permanent impact to category II wetlands, with 0.81 acre.

Under Alternative 2, construction impacts would affect 20 wetlands and would result in the permanent loss (filling) and long-term temporary disturbance of an estimated 1.38 acres of wetland. Of this total, approximately 0.87 acre would be permanently filled and 0.51 acre would be temporarily disturbed during construction. There would be indirect buffer impacts of 3.8 acres. Alternative 2 would have the most amount of impact to the highest category of wetland (Table 1-2, Figure 1) with 0.58 acre of permanent impact to category I palustrine forested (PFO) wetlands. It would also have the largest permanent impact to category IV wetlands, with 0.23 acre.

Under Alternative 3, construction impacts would affect 22 wetlands (Table 1-1) and would result in the permanent loss (filling) and long-term temporary disturbance of an estimated 1.21 acres of wetland. Of this total, approximately 0.74 acre would be permanently filled and 0.45 acre would be temporarily disturbed during construction. Alternative 3 would have the most amount of impact to the category III wetlands (Table 1-2, Figure 1) with 0.32 acre of permanent impacts.

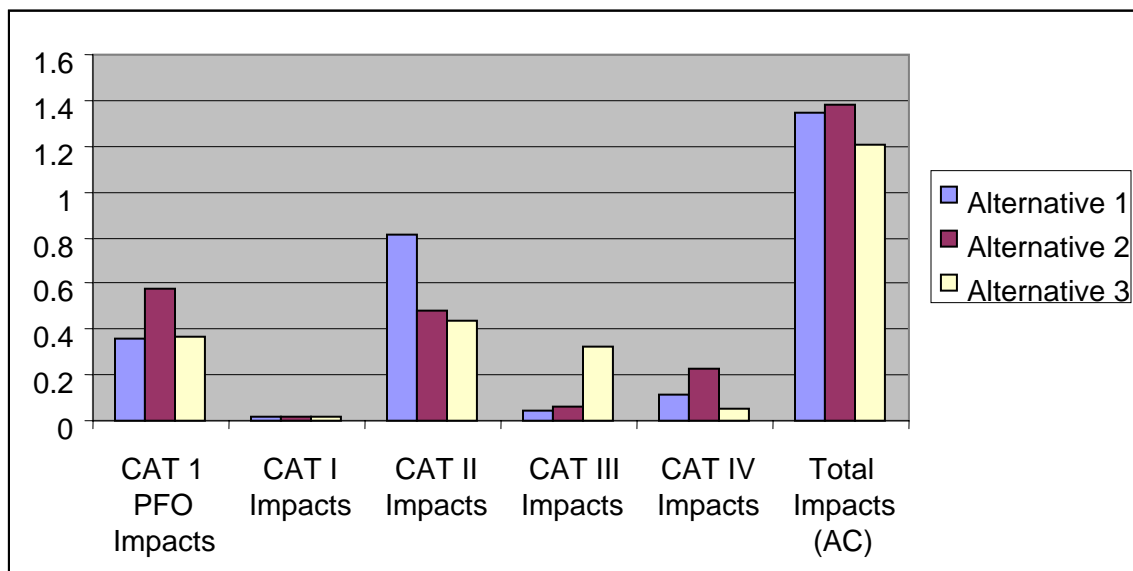
Table 1-1 Permanent Wetland Impacts Summarized by Hydrogeomorphic Classification for Each Alternative

Alternative	Alternative 1	Alternative 2	Alternative 3
Depressional	1.21	1.21	0.88
Riverine	0.09	0.10	0.07
Slope	0.04	0.07	0.25
TOTAL Acres	1.35	1.38	1.21
Total No. of Wetlands	13	20	22

Table 1-2 Permanent Wetland Impacts Summarized by Wetland Rating for Each Alternative

Wetland Rating	Alternative 1	Alternative 2	Alternative 3
Category 1 PFO Impacts	0.36	0.58	0.37
Category I Impacts	0.02	0.02	0.02
Category II Impacts	0.81	0.48	0.44
Category III Impacts	0.04	0.06	0.32
Category IV Impacts	0.11	0.23	0.05
Total Impacts (Acres)	1.35	1.38	1.21

Figure 1 Alternative Impacts



9. Land Use

Project Objectives

The purpose of the NE Novelty Hill Road Project (NHRP) is to improve immediate and long-range transportation mobility of people and goods in the NE Novelty Hill Road (NHR) area within the Bear Creek Planning Area. This area is located between 243rd Avenue NE and Avondale Road NE (Avondale), south of NE 133rd Street to NE Union Hill Road (UHR). The proposed project would address current traffic demand and growth to 2030, as projected by the 2004 “King County Comprehensive Plan” (King County 2004). The proposed project would connect areas of planned urban density to employment and service centers within the cities of Redmond, Bellevue, and Seattle.

The principal objectives of the project include substantially increasing the existing roadway network capacity within this area, improving traffic safety, providing additional system linkage, and facilitating modes of transportation in addition to the use of single-occupancy vehicles. This project is also supported by local, county, and regional transportation studies and adopted plans that have identified capital improvements within the NHRP area as the best way to meet future transportation needs for this area.

The alternatives for this project were also developed based on other key considerations:

- Comply with adopted comprehensive transportation and land use plans
- Avoid excessive community disruption or disproportionate impacts to specific segments of the community
- Avoid unacceptable adverse social, economic, or environmental impacts

Project Alternatives

In addition to the No-Action Alternative that must be evaluated in accordance with the National Environmental Policy Act (NEPA),

three build alternatives were selected following a preliminary alternatives screening process. Each of the three alternatives include a common segment at the eastern end of the project area that begins at 243rd Avenue NE and extends along NE Novelty Hill Road for approximately 2.4 miles to 208th Avenue NE.

In addition to the common segment, Alternative 1 continues to follow NE Novelty Hill Road to its intersection with Avondale Road NE in the city of Redmond, for a total distance of approximately 3.9 miles.

Alternative 2 also follows NE Novelty Hill Road for approximately 1 mile past the common segment. It would then turn south on a newly built segment of roadway that would link NE Novelty Hill Road directly to 196th Avenue NE, which would be widened to its intersection with NE Union Hill Road. Turning west, NE Union Hill Road would also be widened prior to joining the already widened segment of the same arterial roadway within Redmond. This alternative would be approximately 4.3 miles in overall length.

Alternative 3 would follow the common segment of NE Novelty Hill Road before turning south onto 208th Avenue NE, which would then be widened to its intersection with NE Union Hill Road. A substantial segment of NE Union Hill Road would then be widened prior to connecting with the improvements already being made to this corridor in Redmond. This alternative would have an overall length of approximately 5.5 miles.

Current Land Use Patterns

Land use patterns within the study area consist of three major elements: (1) the more intensive and diverse urban land uses within the city of Redmond on the western portions of the study area; (2) the lower-density and predominantly rural residential land uses throughout most of the central and eastern portions of the study area; and (3) a land use pattern of the higher-density, self-contained community defined by the urban planned developments (UPDs) that straddle NE Novelty Hill Road at the eastern end of the project area.

Land within the UPDs and the city of Redmond is part of the urban growth area established in accordance with the Growth Management Act. Zoning in both areas allows for a range of urban land use activities, including higher-density residential and substantial

commercial development. Land adjacent to NE Union Hill Road within Redmond also allows for industrial use. The unincorporated areas of King County in between, as well as farther to the east, are generally designated rural residential under the King County Comprehensive Plan, with corresponding zoning for rural density and allowed uses.

Construction Impacts

Project construction would primarily affect properties that are adjacent to the roadway alignment for the selected alternative. Those properties would be subject to impacts from proximity effects during and after construction, and direct property impacts to varying degrees from the need to acquire temporary and permanent easements, or either full or partial takes where property is needed for additional right-of-way.

No-Action Alternative

No land use impacts would occur as a result of the No-Action Alternative, because no construction activity would occur.

Build Alternatives

For each of the three build alternatives, there would be adverse impacts to adjacent properties and land use activities related to temporary disturbances during construction. In particular, clearing, grading, and new roadway installation would involve temporary adverse impacts to air quality, noise, vegetation, property access, mobility, and social and economic activity. The specific aspects of these impacts and the measures that will be taken to minimize their severity are discussed in other discipline reports for the project. From a land use standpoint, impacts to property would also occur due to the need for permanent easements or acquisition of properties, as well as temporary construction easements. These could result in adverse land use impacts depending on their extent and the degree to which they limit existing use of affected properties.

Alternative 1

Construction activities would potentially have direct, short-term impacts on the approximately 142 parcels adjacent to the 3.9 miles of NE Novelty Hill Road that are part of the project area for this alternative. These parcels include approximately 62 existing

residences. Although a significant number of these parcels will be affected by construction activity, only nine parcels are expected to experience more than minor effects.

Alternative 2

Construction activities would potentially have direct, short-term impacts on the approximately 157 parcels adjacent to the 4.3 miles of existing and new roadway corridor, 67 of which contain residences. Of these, three residences will experience moderate impacts from partial acquisition, and four residences will be moderately affected by slope easements. The remaining parcels and residences will not be adversely affected to more than a minor degree by these direct impacts.

Alternative 3

Construction activities would potentially have direct, short-term impacts on the approximately 171 parcels adjacent to the 5.5 miles of existing roadway corridor, 128 of which contain residences. The greater length of this alternative alignment and the relatively high number of residences along the 208th Avenue NE corridor would result in a higher level of direct impacts compared to Alternatives 1 and 2.

Long-Term Impacts

No-Action Alternative

No land use changes would occur directly from the project because no action would be taken. Changes would still occur in the study area to the extent that the UPDs would continue to be built out as authorized, and as other parcel-specific development activity occurs over time in both unincorporated King County and the city of Redmond. However, it is assumed that these future development activities would be consistent with current land use plans and policies, including the generally restrictive concurrency limitations and rural density requirements throughout most of the project area.

The No-Action Alternative would not be consistent with plans and policies that require sufficient roadway capacity for existing and forecast development in the study area, particularly with respect to the approved urban-level development that has already been permitted for the three Novelty Hill area UPDs. As a result, the No-

1 Action Alternative would have long-term adverse impacts on land
2 use due to worsening traffic congestion problems in the study area,
3 particularly along NE Novelty Hill Road and in the city of Redmond
4 along Avondale Road NE. Increasing traffic congestion along the
5 affected corridors would not change existing land uses directly, but it
6 would diminish the quality of life for people that live along these
7 corridors or that rely on them for local and regional mobility. Rural
8 character would not be adversely affected by new roadway
9 construction under this alternative. However, the quality of life for
10 residents living in the project area (including rural residential areas)
11 would likely be adversely affected by increasing noise, air, and
12 accessibility problems associated with increasing traffic congestion
13 in the area.

14 **Alternative 1**

15 The impacts of this alternative from direct changes to the existing or
16 potential long-term use of parcels directly affected by the project
17 would be limited to nine parcels totaling approximately 25 acres,
18 including the displacement of five existing residences. This would
19 not constitute an adverse impact on land use.

20 This alternative would generally be consistent with applicable land
21 use plans and policies with respect to unincorporated King County
22 and the UPDs. On the other hand, the City of Redmond has
23 commented that this alternative would not be consistent with the
24 Redmond Comprehensive Plan, and the long-term impacts could be
25 unacceptable, based on the impacts that would occur along Avondale
26 Road NE in the city of Redmond (January 12, 2004 letter from City
27 of Redmond). In particular, Redmond noted that the added traffic
28 volumes from this alternative would make Avondale Road NE a less
29 compatible means of mobility for the urban residential community
30 along this corridor.

31 **Alternative 2**

32 Direct impacts to land use from full parcel acquisition would involve
33 10 parcels totaling approximately 20 acres, although approximately
34 18 acres of that would be two parcels of undeveloped land already
35 owned by King County for the construction of stormwater
36 management facilities. The remaining acquisitions would displace
37 seven residences. The loss of seven residential properties would not
38 have an adverse impact on long-term land use in the study area.

Alternative 2 would generally be consistent with applicable land use plans and policies. However, this alternative would require more substantial consideration of applicable King County Critical Areas Ordinance and other environmental requirements, to the extent that it involves building an entirely new roadway segment across the environmentally sensitive areas between NE 95th Street and NE Novelty Hill Road.

By redirecting NE Novelty Hill Road traffic volumes away from its intersection with Avondale Road NE to NE Union Hill Road, this alternative is consistent the plans and policies of the City of Redmond that have established NE Union Hill Road as a five-lane facility and therefore a more appropriate corridor for channeling increasing traffic from the east to SR 520.

Alternative 3

Alternative 3 would generally be consistent with applicable land use plans and policies. However, this alternative would have direct effects on properties along a project corridor of approximately 1.2 and 1.6 miles greater length than Alternatives 2 and 1, respectively. This would have the potential to change the existing character of more land area.

Similar to Alternative 2, this alternative would be more compatible with the plans and policies of the City of Redmond because it would also redirect NE Novelty Hill Road traffic volumes away from the intersection with Avondale Road NE to the already expanded, five-lane arterial along NE Union Hill Road that connects more directly to SR 520.

Direct impacts to land use from full parcel acquisition would involve 13 parcels totaling approximately 32 acres, which is the most for any of the alternatives. As with the other build alternatives, a substantial amount of this area (three parcels of approximately 22.5 acres) would consist of undeveloped land already owned by King County that would be used to locate stormwater facilities. However, 10 residential properties would be displaced. Although this constitutes a substantially higher direct impact to parcels along the affected segment of 208th Avenue NE, it would not have a substantial long-term adverse effect on land use in the study area.

Secondary and Cumulative Impacts

Regardless of which build alternative is selected, the construction of a project that substantially improves mobility within and through the study area could increase the potential for development pressure in the areas that it serves. However, much of the pressure for such cumulative or secondary development is less relevant in this case, because the UPDs that would be served by the project have already been planned and approved. As a result, the transportation and land use impacts from these projects will largely occur whether or not the NHRP is built. In addition to the UPDs, the forecasted growth in the study area is also expected to occur regardless of the NHRP. Consequently, the project is needed to address the immediate demands associated with development that will occur prior to construction of the NHRP. Additional development in the unincorporated rural areas of King County within the study area is expected to occur to forecasted levels. That growth is consistent with applicable regional and local plans and policies, and it is anticipated regardless of which build alternative is selected.

Mitigation Measures

The No-Action Alternative would avoid impacts associated with extensive construction activity; however, it would not be consistent with land use plans and policies. In particular, the improvements to NE Novelty Hill Road represented by the three build alternatives are needed to address the existing transportation demand, which has increased substantially due to development of the UPDs and ongoing population growth to the east and north of the project area. No measures have been identified that can adequately address these impacts other than through the significant improvements to the roadway corridor envisioned in the build alternatives.

For any of the build alternatives, a variety of mitigation measures would be taken to address the full range of potential environmental impacts during construction that could adversely affect land use. In general, best management practices (BMPs), regulatory requirements, and permit conditions will limit the impacts of construction activities such that direct physical impacts from project construction will not have an adverse effect on land use. Specific measures would also be developed to reduce disruption to area

1 residents and affected property owners from detours and other
2 potential inconveniences during construction.

3 The build alternatives were developed in accordance with applicable
4 local, regional, state, and federal plans and policies. Additional input
5 has also been provided by the City of Redmond, King County staff
6 responsible for the UPD planning and development process, and
7 relevant state and federal agencies. These efforts have been
8 attempted to avoid and minimize land use impacts associated with
9 each build alternative. Following selection of the Preferred
10 Alternative, further engineering and design would be done to address
11 site-specific mitigation requirements. Long-term property acquisition
12 issues would also be addressed through applicable federal and state
13 regulations regarding compensation and relocation procedures.

14 **Comparison of Impacts by Alternatives**

15 No substantial adverse impacts to land use are anticipated for any of
16 the project alternatives from short-term construction, although the
17 extent would be somewhat greater for Alternative 3 based on its
18 longer length. The need for construction-related acquisitions and
19 easements is not expected to have a substantial adverse effect on the
20 existing or future land uses in the study area.

21 The No-Action Alternative is not consistent with a number of
22 applicable plans and policies that support the need to improve the
23 transportation capacity of the NE Novelty Hill Road corridor. This
24 additional capacity supports existing development that is largely
25 built out already, as well as planned and forecasted development that
26 is also consistent with regional and local plans and policies.

27 The build alternatives are all generally consistent with applicable plans
28 and policies with the exception of Alternative 1. In that case, the City of
29 Redmond has noted that Alternative 1 is not consistent with their
30 policies and plans pertaining to land use along Avondale Road NE, and
31 no specific mitigation measures have been identified to address that.

10. Socioeconomics

King County proposes the NE Novelty Hill Road Project to improve immediate and long-range transportation mobility of people and goods in the NE Novelty Hill Road area within the Bear Creek Planning Area. This area is located between 243rd Avenue NE and Avondale Road NE, south of NE 133rd Street to NE Union Hill Road. The proposed project would address current traffic demand and growth to 2030, as projected by the 2004 “King County Comprehensive Plan” (King County 2004). It would also connect areas of planned urban density to employment and service centers within the cities of Redmond, Bellevue, and Seattle.

This Socio-Economic Discipline Report describes the existing environment and analysis of potential effects and benefits on social- and economic-related elements from construction and operation of the NE Novelty Hill Road Project. The following topics are addressed in this report: (1) social resources; (2) public resources; (3) utilities; (4) parks, recreation, pedestrians, bicycles, and transit; (5) economics; (6) relocations; and (7) environmental justice (EJ).

Project Objectives

The principal objectives of the project include substantially increasing the existing roadway network capacity within this area, improving traffic safety, providing additional system linkage, and facilitating modes of transportation in addition to the use of single-occupancy vehicles. This project is also supported by local, county, and regional transportation studies and adopted plans that have identified capital improvements within the project area as the best way to meet future transportation needs for this area.

The alternatives for this project were also developed based on two other key considerations:

- They avoid excessive community disruption or disproportionate impacts to specific segments of the community; and

- They avoid unacceptable adverse social, economic, or environmental effects.

Project Alternatives

In addition to the No-Action Alternative that must be evaluated in accordance with the National Environmental Policy Act (NEPA), three build alternatives were selected following a preliminary alternatives screening process. The three alternatives each include a common segment at the eastern end of the project area that begins at 243rd Avenue NE and extends along NE Novelty Hill Road for approximately 2.4 miles to 208th Avenue NE.

In addition to the common segment, Alternative 1 continues to follow NE Novelty Hill Road to its intersection with Avondale Road NE in the city of Redmond, for a total distance of approximately 3.9 miles.

Alternative 2 also follows NE Novelty Hill Road for approximately 1 mile past the common segment to address safety issues in this area. It would then turn south on a newly built segment of roadway that would link NE Novelty Hill Road directly to 196th Avenue NE, which would be widened to its intersection with NE Union Hill Road. Turning west, NE Union Hill Road would also be widened prior to joining the already widened segment of the same arterial roadway within Redmond. This alternative would be approximately 4.3 miles in overall length.

Alternative 3 would follow the common segment of NE Novelty Hill Road before turning south onto 208th Avenue NE, which would then be widened to its intersection with NE Union Hill Road. A substantial segment of NE Union Hill Road would then be widened prior to connecting with the improvements already being made to this corridor in Redmond. This alternative would have an overall length of approximately 5.5 miles.

Social Resources

The social resources in the study area defined for the project and vicinity were analyzed using regional, county, and local demographics and with consideration of limited English proficiency populations; growth trends; community, social, employment, and cultural facilities and centers; religious institutions and cemeteries; neighborhoods; and community cohesion. Generally, demographics,

1 including population of the study area, and growth trends within the
2 study area are not expected to change significantly due to the No-
3 Action Alternative or any of the build alternatives; however, full
4 build out of Redmond Ridge East is contingent upon completion of
5 the project and may not occur under the No-Action Alternative. The
6 rural character in the unincorporated rural portion of the study area
7 would change under any of the build alternatives; however, they
8 would be most noticeable to the community living along 196th
9 Avenue NE under Alternative 2.

10 Social resources and the other resources addressed in this report
11 include residents, communities, neighborhoods, service providers,
12 and businesses that would experience up to 6 years of construction
13 and may be affected temporarily by the construction. This length of
14 construction will be dependent upon the phasing of the project. The
15 potential effects would include temporary construction-related truck
16 traffic, traffic detours, traffic congestion and delays, equipment
17 emissions and dust, and noise. These effects may be experienced by
18 the traveling public accessing the right-of-way or adjacent and
19 nearby properties as construction proceeds up or down the corridor.

20 Operational effects that would affect social resources and the other
21 resources addressed in this report include benefits from improved
22 traffic flow upon completion of construction with one exception of
23 increased PM travel times on Avondale Road NE under Alternative
24 1. Safety improvement associated with each of the build alternatives
25 would be a benefit to all roadway and right-of-way users. Residents,
26 neighbors, and commuters may perceive a change in the rural
27 character along the NE Novelty Hill Road area common to each of
28 the alternatives due to vegetation removal associated with widening
29 the roadway.

30 Neighborhood cohesion characteristics vary within the study area,
31 and temporary adverse effects may arise during construction, such as
32 traffic congestion, delays, detours, and an increase in air and noise
33 pollution. Under Alternative 1, all residents along Avondale Road
34 NE within the study area may experience longer delays traveling to
35 and from their homes, and residents in subsidized housing near the
36 intersection of Avondale Road NE and NE Novelty Hill Road may
37 have access delays in entering and exiting their developments. Under
38 any of the build alternatives during the operational phase,
39 neighborhood cohesion characteristics may be negatively affected by

1 issues such as changing travel routes and increased traffic, wider
2 roadways with less native vegetation, and changes to roadway
3 crossings and turning ability. However, improvements such as wider
4 roadway shoulders and possible new sidewalks or crosswalks may
5 improve neighborhood cohesion by encouraging more nonmotorized
6 commutes and walking within neighborhoods.

7 **Public Resources**

8 The public resources in the study area and vicinity that were
9 analyzed include fire protection, hospital and emergency medical
10 services, law enforcement services, schools, solid waste facilities,
11 and government institutions and services. Construction effects under
12 any of the build alternatives would include potential delays and
13 detours for fire, emergency medical, and law enforcement personnel
14 access and response times, though these effects are not expected to
15 be significant. The fire station located on 208th Avenue NE would be
16 more directly affected by construction under Alternative 3 than under
17 any other alternatives. The completed project is expected to allow for
18 quicker response times by public service providers.

19 During construction, travel times to and from schools may increase
20 for buses and students. At project completion, commute times to
21 schools should improve except for PM travel time to Einstein
22 Elementary, which may increase for those traveling along Avondale
23 Road NE. However, more commuters choosing to travel different
24 routes may affect accessing school driveways located directly on any
25 of the build alternative corridors (e.g., Bear Creek School on 208th
26 Avenue NE under Alternative 3). Increased traffic could also result
27 in an increase in traffic noise and decrease air quality at schools
28 directly on any of the build alternative corridors.

29 There may be temporary short-term delays in garbage, recycling, and
30 yard waste services to residents and businesses during construction.
31 There should be no direct effects to postal services or other
32 government institutions during construction or operation.

33 **Utilities**

34 Existing utilities in the study area include electricity, natural gas,
35 water, wastewater, telecommunication services, and an Intelligent
36 Transportation System (ITS). An estimated 95 percent of existing
37 utilities are located within existing public right-of-way, where the

majority of construction and subsequent operation would occur. Electrical lines are owned primarily by either Puget Sound Energy or Bonneville Power Administration, and Puget Sound Energy also provides natural gas within the study area. The City of Redmond provides wastewater disposal for the urban planned developments (UPDs) and areas within the city limits, while all other residences and businesses use septic tanks. Water is provided by both the City of Redmond Water District and the Union Hill Water District. Telecommunication services are provided by Verizon and Comcast. There are no significant differences in utilities between the three build alternatives. Mitigation measures would be used where appropriate to avoid and minimize effects to utilities and their customers.

Parks, Recreation, Pedestrians, Bicycles, and Transit

Park, recreation, pedestrian, bicycle, and transit resources in and around the study area, including trails, equestrian facilities, transportation services, related safety issues, and related plans and policies, were analyzed. During construction, the three build alternatives would have similar impacts for pedestrians, bicyclists, equestrians, and transit users, although Alternatives 2 and 3 could temporarily restrict or close access to parks and recreational facilities in the project area. There are numerous recreational facilities in the project area; however, with any alternative, only a minimal amount of recreational property acquisition would be required. Alternative 1 would not result in operational effects on any park, trail, or other recreational facility. With Alternatives 2 and 3, King County would have to acquire property from two public parks: Perrigo Community Park and Arthur Johnson Park. The land acquired from these resources represents a fraction of 1 percent of the total area of each resource and would result in a negligible effect on these resources.

All three build alternatives would affect one common trail resource, the Bear & Evans Creek Trail & Greenway. The effect on this trail would occur where the trail crosses NE Novelty Hill Road and NE Union Hill Road. Most likely, trail users would be rerouted to the nearest intersection for a signal crossing, rather than a pedestrian underpass. The portion of the trail that would be affected by this project has not yet been constructed, providing King County an

1 opportunity to work with the City of Redmond in addressing these
2 effects.

3 **Economics**

4 The regional and local economic resources in the study area,
5 including business districts, retail/commercial centers, and other
6 industries and businesses, and farms and farm products, was
7 analyzed by reviewing employment and population trend data from
8 the Puget Sound Regional Council (PSRC) and the U.S. Census
9 Bureau. Manufacturing and finance, insurances, real estate, and
10 services (FIRES) are the largest employment sectors in a large
11 portion of the study area. This is expected to remain true through
12 2030, but employment opportunities in the study area are not
13 expected to increase as rapidly as the population. While
14 manufacturing and FIRES are the largest employment sectors in the
15 study area, they do not make up the majority of business.
16 Construction businesses are actually more prevalent in the study
17 area; however, they have fewer employees.

18 Temporary effects related to construction include the creation of jobs
19 and increases in sales tax revenue. Each of the three build
20 alternatives would create temporary jobs associated with
21 construction. Alternative 3 would create the most jobs because it is
22 the most expensive to construct. Alternative 2 would create the next
23 highest number of jobs, and Alternative 1 would create the least
24 number of jobs. Similarly, sales tax revenue would also be generated
25 by construction. Alternative 3 would create the most sales tax
26 revenue, Alternative 2 would create the second most, and Alternative
27 1 would create the least. Adverse effects to businesses during
28 construction will be minimized through the use of appropriate
29 mitigation measures.

30 Long-term effects from each build alternative are similar for each
31 alternative. Neither property tax revenue nor sales tax revenue is
32 expected to change as a result of project operation. Future
33 employment rates are also not expected to change based on operation
34 of the project. On the other hand, travel time savings, which can
35 affect economics, do differ for each build alternative. Alternative 1
36 would provide the least overall travel time savings along the project
37 route and would not provide any time savings on Avondale Road NE
38 in the PM. Alternative 2 would provide the most overall time savings

on Avondale Road NE and would also provide the most time savings along the project route in the PM. Alternative 3 would provide more travel time savings along the project route in the AM and a moderate amount of time savings along Avondale Road NE.

Relocation

Partial and complete acquisitions of property required by this project were analyzed. Relatively few properties in the study area would require full permanent acquisition for the project operation.

Alternative 1 would require the least number of potential full property acquisitions with a total of 9, Alternative 2 would require an intermediate number of potential full property acquisitions with 10 total, and Alternative 3 would require the most potential full property acquisitions with a total of 13. The potential full property acquisitions required for Alternatives 2 and 3 each include a licensed adult group home.

Additional properties have been identified that would require potential partial property acquisitions and easements to accommodate slopes or the construction of walls. Alternatives 1 and 2 would require a similar number of permanent partial property acquisitions (52 and 51 respectively), while Alternative 3 would require fewer of these partial acquisitions with a total of 42. Alternative 1 would require the least number of permanent easements at 42, Alternative 2 would require 67 permanent easements, and Alternative 3 would require 96 permanent easements.

In addition to the potential for permanent acquisition of property associated with this project, there are also temporary easements that will be necessary for construction. Alternatives 1, 2, and 3 would all require a similar number of temporary construction easements (20, 21, and 21 respectively). These easements would only be required during construction and have no other lasting effect.

Where parcel acquisitions cannot be avoided, relocation assistance would be provided for all property owners of residences and businesses without discrimination, including help in locating suitable replacement housing and business sites.

Environmental Justice

Environmental justice (EJ) issues, including a public involvement plan; the locations, types and number of EJ populations; gathering

places and services of significance; and disproportionately high and adverse effects were analyzed. At the first level of analysis, the demographic data show that there are more EJ populations within the study area than within a larger comparison area primarily because of the large number of minorities living at the UPDs. At the next level of analysis comparing alternatives to each other, there are more EJ populations along Alternative 1 than along Alternatives 2 and 3, because of higher concentrations of minorities and low-income populations along Avondale Road NE within the study area.

The conclusion that there may be disproportionately high adverse effects to EJ populations at the first level of analysis is complicated when the context of the project and study area is considered. The benefits received by the relatively large minority population in the UPDs in the operational phase of the project under any build alternative may ultimately result in mitigating adverse effects during construction. When comparing alternatives, there would be greater disproportionately high adverse effects to EJ populations under Alternative 1 than Alternatives 2 or 3. When comparing Alternatives 2 and 3, there are more EJ populations affected in Alternative 3 versus Alternative 2; however, on a percentage basis these two alternatives are very close in numbers. At this preliminary design phase of the project, there is limited ability to conduct a third level of analysis that would involve looking at disproportionately high adverse effects within each alternative. Once a preferred alternative is selected, this level of evaluation will be conducted with more specificity than is currently possible.

Possible mitigation opportunities are discussed in this report and will continue to be considered and developed as King County decides on a preferred alternative, continues design work, and enters the construction phase of the project.

31

11. Visual Quality

This Draft Discipline Report describes existing conditions and potential impacts to visual resources from the NE Novelty Hill Road Project (Project). The purpose of the Project is to improve immediate and long-range transportation mobility of people and goods in the NE Novelty Hill Road corridor area near Redmond, Washington. Three build alternatives were chosen for detailed evaluation, including segments along NE Novelty Hill Road, NE Union Hill Road, 196th Avenue NE, and 208th Avenue NE.

Existing conditions were evaluated through a combination of literature search and field investigation. Visual impact analyses were conducted according to Federal Highway Administration *Visual Impact Assessment for Highway Projects* guidelines and Washington State Department of Transportation *Environmental Procedures Manual M31-11*.

The Bear Creek section of the King County Comprehensive Plan identifies 196th Avenue NE south of its intersection with NE Union Hill Road as the historic “Red Brick Road,” an important resource in the study area. No other policies, goals, or objectives specific to managing visual quality within the study area were identified, nor were any other important or significant visual or aesthetic resources.

Direct impacts to visual quality from construction are generally the same among the three build alternatives. However, Alternative 3 would result in the removal of the most vegetation, approximately 60 acres, compared to Alternatives 1 and 2 with 18 acres and 26 acres of removal, respectively. Direct impacts from Project operation include the removal of vegetation, roadway expansion, and addition of features such as retaining walls, lighting, signage, and fencing.

Indirect and cumulative impacts include potential increases in traffic, which could detract from visual quality. Alteration of the landform could also affect visual quality as surrounding lands are developed.

1 The Project appears to be compatible with applicable policies, goals,
2 and objectives. Furthermore, the proposed actions would not
3 adversely affect important or significant visual or aesthetic
4 resources. For these reasons, mitigation is not required, even though
5 impacts may be relatively high in some areas. However, the
6 following mitigation measures are suggested to further reduce
7 unavoidable project impacts:

- 8 ▪ Use principles of context-sensitive design when developing
9 structures, especially walls, associated with the project.
- 10 ▪ Select construction materials that match the color and
11 texture of surrounding landscape (e.g., natural stone facing,
12 simulated stone, rockery) with special attention given to the
13 walls.
- 14 ▪ Select light standards that complement the rural character of
15 the majority of the site.
- 16 ▪ Incorporate landscaping that provides naturalistic transition
17 rather than abrupt change between rural and urban areas.
- 18 ▪ Develop revegetation plans that reflect the natural character
19 of the native landscape, including overhead canopy and
20 successive understory layers.
- 21 ▪ Design the horizontal and vertical alignments to “best fit”
22 the existing ground and visual environment while meeting
23 applicable highway safety design standards.
- 24 ▪ Minimize the removal of native vegetation and soil
25 disturbance along the road corridors to the greatest extent
26 practicable.
- 27 ▪ Selectively salvage native plants throughout the project area
28 for transplanting elsewhere along the project corridor or at
29 other sites within the same sub-basin.
- 30 ▪ Establish adequate budget for a 2-year plant establishment
31 period.
- 32 ▪ Combine and group directional and informational signage
33 where possible.
- 34 ▪ Eliminate unnecessary signage to reduce visual clutter.

1 **12. Cultural Resources**

2 King County proposes to improve the mobility of people and goods
3 in the NE Novelty Hill Road (NHR) area within the Bear Creek
4 Planning Area. The proposed project would connect areas of planned
5 urban density to employment and service centers in the cities of
6 Redmond, Bellevue, and Seattle.

7 To meet the goals of the NE Novelty Hill Road Project, three build
8 alternatives were chosen from a pool of ten original alternatives.
9 Each alternative, as well as the No-Action Alternative, is considered
10 individually in this Cultural Resources Discipline Report.

11 This Cultural Resources Discipline Report specifically addresses the
12 NE Novelty Hill Road Project. Chapters 1 and 2 present the purpose
13 and need for this project and describe the alternatives that are being
14 considered in the evaluation of the project. Chapter 3 outlines the
15 historic context for resources located along the project alternatives
16 and discusses the regulatory context under which these resources are
17 protected. Historic properties that would be affected by the NE
18 Novelty Hill Road Project are identified in Chapter 4, and Chapter 5
19 reviews the level of impacts that would occur under each alternative.
20 Suggested mitigation measures to lessen the effects of the project
21 impacts are presented in Chapter 6.

22 Background research and a field inventory of cultural resources
23 identified three historic sites and one prehistoric archaeological site
24 eligible for the National Register of Historic Places.

25 In this report, we have evaluated three build alternatives as well as
26 the No-Action Alternative. Our findings suggest that Alternative 1
27 would adversely affect one historic property, Alternative 2 would
28 have an adverse effect on four historic properties, and Alternative 3
29 would adversely affect three historic properties. Recommendations
30 include completion of Section 106 compliance and suggested
31 mitigation measures for adverse effects to cultural resources.

13. Hazardous Materials and Wastes

Introduction

This discipline report presents information on potential environmental concerns relating to hazardous materials¹ on properties affected by or potentially having an affect on the NE Novelty Hill Road Project (NHRP) because of the presence of environmental contaminants. Proposed improvements include construction of one of three build alternatives. A No-Action Alternative is also evaluated.

The findings and discussion presented in this Hazardous Materials Discipline Report are based on preliminary project design drawings and information available as of June 2006. Impacts and mitigation will be better determined once the design is further refined and allows assessment of specific construction practices.

King County is considering roadway improvements within an area bounded by NE Novelty Hill Road (NHR) to Avondale Road NE in the city of Redmond; State Route (SR) 520 (western terminus); and the intersection of NHR and 243rd Avenue NE (243rd) (eastern terminus). The southern boundary is NE Union Hill Road (UHR) from about Evans Creek to just east of 208th Avenue NE (see Figure 2-1). This area makes up what is referred to as the project area.

¹ Defined by WSDOT (2006) as a generic term for any media that contains organic or inorganic constituents considered toxic to humans or the environment. This term covers dangerous waste, problem waste, solid waste, and hazardous substances.

The study area for this Hazardous Materials Discipline Report includes the project area as well as the area within 1 mile of the three project alternative alignments. The study area was divided into segments to facilitate focused evaluation of hazardous materials impacts on the project. Each study area segment was subjected to a research method consisting of a public records review, a historical land survey, contacts with government agencies, and field reconnaissance. A site screening assessment and land use profile for the study area was developed from the research results.

Affected Environment

Ninety-four potential hazardous materials risk sites were identified within 1 mile of the project area during initial research. Twelve sites were identified within one-eighth mile of the project alternatives. Of these, three sites were determined to require further evaluation because of proximity to the project corridor and lack of definitive information about hazardous materials. Additionally, eight properties with structures that could be displaced under different alternatives were identified. Based on the age and style of the structures, these properties could have asbestos-containing building materials (ACM), lead-based paint (LBP), polychlorinated biphenyls (PCBs), and heating oil tanks.

Impacts

Impacts anticipated under Alternative 1 include encountering ACM, LBP, PCBs, and heating oil tanks in or near three structures requiring demolition because of displacement. One site near the alignment, site 11, has a low to moderate risk of hazardous materials impact to the project.

Impacts anticipated under Alternative 2 include encountering ACM, LBP, PCBs, and heating oil tanks in or near five structures requiring demolition because of displacement. For this alternative, there is also a low likelihood of encountering unknown contamination from a spill that occurred during 1999 at the western terminus of this alternative alignment. Two sites near the alignment, sites 11 and 46, have low to moderate risk of hazardous materials impact to the project.

Impacts anticipated under Alternative 3 include encountering ACM, LBP, PCBs, and heating oil tanks in or near four structures requiring

demolition because of displacement. For this alternative, there is also a low likelihood of encountering unknown contamination from a spill that occurred during 1999 at the western terminus of this alternative alignment. Two sites near the alignment, sites 11 and 46, have low to moderate risk of hazardous materials impact to the project.

There is a potential for encountering unknown hazardous materials with any construction project involving excavation in previously urbanized areas or demolition of structures. Construction activities could result in inadvertent release of these hazardous materials, if encountered.

Cleanup and disposal options for hazardous materials are similar regardless of alternative. Depending on the level of contamination, soils requiring excavation would either be used as fill under paved (or some other appropriate capping method) surfaces, or transported off-site for treatment or disposal. ACM, materials surfaced with LBP, and PCBs would need to be removed from structures prior to demolition and disposed of in appropriately permitted landfills. Heating oil tanks, if present, would need to be removed under applicable permits, and any contamination would need to be remediated.

Mitigation

Construction planning, including development of spill prevention, control, and countermeasures plans; erosion and sedimentation control plans; and plans for handling unanticipated contamination would be the primary mitigation measures for construction impacts related to existing or new contamination in soil or water.

Avoidance of structures containing ACM, LBP, PCBs, or heating oil tanks is the preferred mitigation for these hazardous materials. If the structures cannot be avoided, these hazardous materials would be removed prior to demolition and disposed properly as a mitigation measure.

14. Section 4(f) Evaluation

What is Section 4(f) and what are Section 4(f) resources?

Section 4(f) of the United States Department of Transportation Act of 1966, codified in Federal law at 49 U.S.C. § 303, declares that “It is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites.”

Section 4(f) specifies that “The Secretary [of Transportation] may approve a transportation program or project...requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if –

- there is no prudent and feasible alternative to using that land; and
- the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.”

Section 4(f) further requires consultation with the Department of the Interior and, as appropriate, the involved offices of the Departments of Agriculture and Housing and Urban Development in developing transportation projects and programs that use lands protected by Section 4(f).

What constitutes a “use” of Section 4(f) resources?

“Use” of Section 4(f) lands is not limited to property acquisition. Significant impacts on aesthetics, access, air quality, noise levels,

water quality, or land use in the area may also constitute a use of Section 4(f) resources.

When would a constructive use occur?

Another type of use is constructive use. Constructive use occurs when the proximity impacts (including mitigation) of a project on the 4(f) resource are so severe that the activities, features, or attributes that qualify the property or resource for protection under Section 4(f) are substantially impaired. Substantial impairment occurs when the activities, features, or attributes of the 4(f) property are substantially diminished (23 C.F.R. 771.135(p)(2)), which means that the value of the resource in terms of its Section 4(f) significance will be meaningfully reduced or lost. The degree of impact and impairment is determined in consultation with the officials having jurisdiction over the resource.

What is Section 6(f) and what are Section 6(f) resources?

Section 6(f) of the Land and Water Conservation Fund Act (LWCFA) concerns transportation projects that propose impacts to, or the permanent conversion of, outdoor recreation property that was acquired or developed with LWCFA grant assistance, which in Washington State is distributed by the Interagency Committee for Outdoor Recreation (IAC).

The National Park Service (NPS) of the Department of the Interior must approve any conversion of property acquired or developed under this act for use other than public, outdoor recreation. Section 6(f) directs the NPS to ensure that replacement lands of equal value, location, and usefulness are provided as conditions to approval of land conversions. Therefore, where a Section 6(f) land conversion is proposed for a highway project, replacement land will be necessary.

How is Section 6(f) relevant to Section 4(f)?

Section 6(f) and Section 4(f) resources are both publicly owned resources that warrant evaluation of what the potential impacts of transportation projects will be on them. Section 6(f) resources are funded, at least in part, by a grant from the LWCFA while Section 4(f) resources are not.

For the NE Novelty Hill Road Project, two Section 4(f) resources received monies from the LWCFA, making them also Section 6(f)

resources. These two resources are Farrel-McWhirter Park and the Bear & Evans Creek Trail & Greenway.

15. References

- Hinman, C. May 2005. Low Impact Development Technical Guidance Manual for Puget Sound. Puget Sound Action Team. Publication # PSAT 05-03. Accessed August 11, 2006 <http://www.psat.wa.gov/Publications/LID_tech_manual05/LID_manual2005.pdf>.
- King County (2004). 2004 King County Comprehensive Plan. Adopted September 27, 2004. Accessed at: <http://www.metrokc.gov/ddes/compplan/>.
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- WSDOT (Washington State Department of Transportation) (2006). *Environmental procedures manual, Section 425, Air*. M31-11. March 2006.